



MAGAZINE



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Contributors

Cedric Jagger heads the Departmental Services Section of Central Publicity Department. His liking for fob seals is an offshoot from his principal spare-time interest—the study of antique watches. Helped found the Antiquarian Horological Society in 1953 and has served on its Council since. Also interested in education, he has recently been elected to the governing body of a mixed primary school in Surrey.

Harry King of Head Office Research and Development Department spends most of his leisure time in contact with Grand Prix motor racing and its personalities. One of the founders of the present Brands Hatch racing circuit, he is now closely associated—particularly on questions of design—with the Stirling Moss and United Dominions Trust/Laystall teams.

James Pattison joined the Company as an experimental officer in 1957. Works in the general exploratory section of HOC's Research Department. His interests include "messing about with the Austin Seven," record collecting, and youth work in the Methodist Church.

Frank Perkins, OBE, is an engineer who early in his professional life became interested in education and training. Taught in technical colleges, became an inspector of schools, and during the war visited the United States on behalf of the Ministry of Labour to study at first hand methods for the rapid training of operatives and supervisors. In 1946 became the first ICI Education Officer and helped to lay the foundation of the comprehensive system of education and training which now exists throughout the Company. Is a member of several national bodies connected with this subject.

Cover

FRONT COVER: *An arrangement of children's building bricks symbolising the growth of trade between European countries, which doubled in the period 1953–60. In contrast, trade in the rest of the world increased by only a third.*

The ICI Magazine, price twopence, is published monthly for the interest of all who work in ICI, and its contents are contributed largely by people in ICI. Edited by Sir Richard Keane, Bt., with the assistance of Colin Forbes as art editor and Anne Bilsland as news editor, it is printed at The Kynoch Press, Birmingham, and published by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London S.W.1 (phone VICTORIA 4444). The editor is glad to consider articles and photographs for publication, and payment will be made for those accepted.



Cedric Jagger



Harry King



James Pattison



Frank Perkins

From my point of view

Blinded by Science, by Mark Abrams

SINCE the end of the war certain propositions about education and scientists have become increasingly fashionable among all "forward-looking" people. They seem to have reached agreement that the country would be much better off if we had more higher education, if a larger proportion of young people receiving this higher education studied science, and if the non-scientific students were compelled to learn some of the basic principles of science so as to broaden their minds.

More Science Students

We are now well on the way to achieving the first two of these goals. Compared with the last of the pre-war academic years, we now have twice as many full-time students in the universities; the proportion of these students studying pure science and technology has gone up by roughly 50%, and "arts" students (those studying literature, history, languages, economics, etc.) are now a diminishing minority.

According to the Committee on Scientific Manpower, we are also well on the way to having an adequate supply of scientists, and are about to enjoy the fruits of the drive for scientists that has been sustained over the past ten years. What sort of benefits can we expect? Almost certainly one of the results will be higher industrial productivity and greater material prosperity for everybody. A recent survey suggests, however, that this is not the whole story.

Towards the end of 1961 the students of Cardiff University College carried out an enquiry among those of its members who are going to sit for

their degree this summer. Just over half the men are studying science (including medicine and technology), and the rest are arts students. In many ways the two groups have a great deal in common. In both a solid majority have their homes in Wales, have attended local State grammar schools, and come from working class and lower middle class homes.

A Significant Survey?

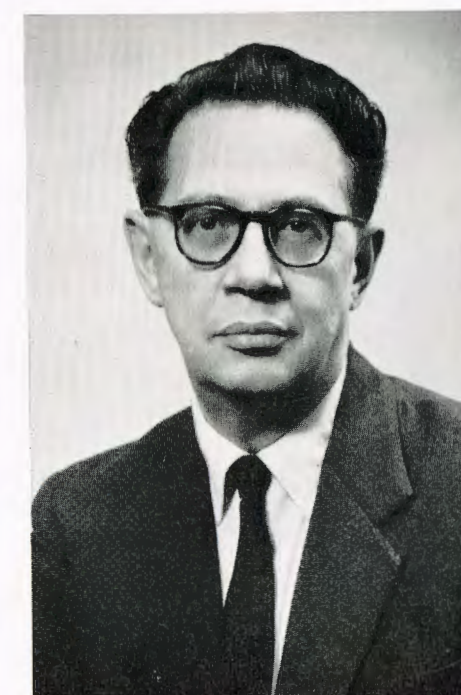
But in their opinions and aims the two groups differed appreciably. For example, as compared with arts students the survey shows that young scientists

of them wanted to be teachers—either at the university or school level; and fewer of them read serious newspapers.

It would be very rash to generalise about young scientists as a whole merely from the findings of a survey carried out in one year and at one university college, but there are two or three other studies completed in previous years at English universities which all point in the same direction. Of course, on the available evidence we still do not know which is cause and which is effect. It is possible that present-day methods of training scientists turn young men into citizens who are socially unimaginative and conformist; or it may be the other way round—that unimaginative young men are the ones most likely to choose to study science. But really it does not matter what the causal sequence is. Either way it looks as if the time has come for educational reformers to adjust their aims.

Need for Wider Training

So far the fashionable extremist tendency has been to demand that no arts student should be allowed to be ignorant of the second law of thermodynamics. This might now at least be supplemented by an equally emphatic demand that every intending scientist should be given a training wide enough for him to acquire some liberal attitudes and some aesthetic interests.



Mark Abrams

are less prone to support the spending of any public funds to aid music, drama, art, etc.; that fewer of the scientists were interested in any further education after they had taken their degree; fewer

The opinions expressed in this article are not necessarily those of the Company

ICI GOES INTO EUROPE

—THE IDEAS BEHIND THE PLANS

By B. R. Goodfellow, European Council

No one who has been more than once to the Continent of Europe in recent years on business or on holiday can have failed to notice around him the many signs of rapidly growing prosperity. It is one of the miracles of the mid-twentieth century.

At the end of the war nearly every country in Europe had in common two things: each had suffered the humiliation of an enemy occupying power and each had much of its economy devastated by fighting and bombing: bridges were destroyed, factories were disabled. Apart from the neutrals, only Britain escaped such extensive damage; though we and our cities had suffered indeed from bombing, our transport system and our industries were almost unscathed. They had simply suffered the strain of years of overloading.

In 1946 Europe's economy and morale seemed almost beyond hope of recovery. Europe, as well as the UK, owes to the Americans one of the greatest political acts of statesmanship the world has ever known, the Marshall Plan of assistance to the rehabilitation of Europe. With this help and with hard work, Western Europe had by 1953 virtually recovered her pre-war position, proudly equipped with brand new railway systems and with newly equipped factories with men to run them who believed again in the future.

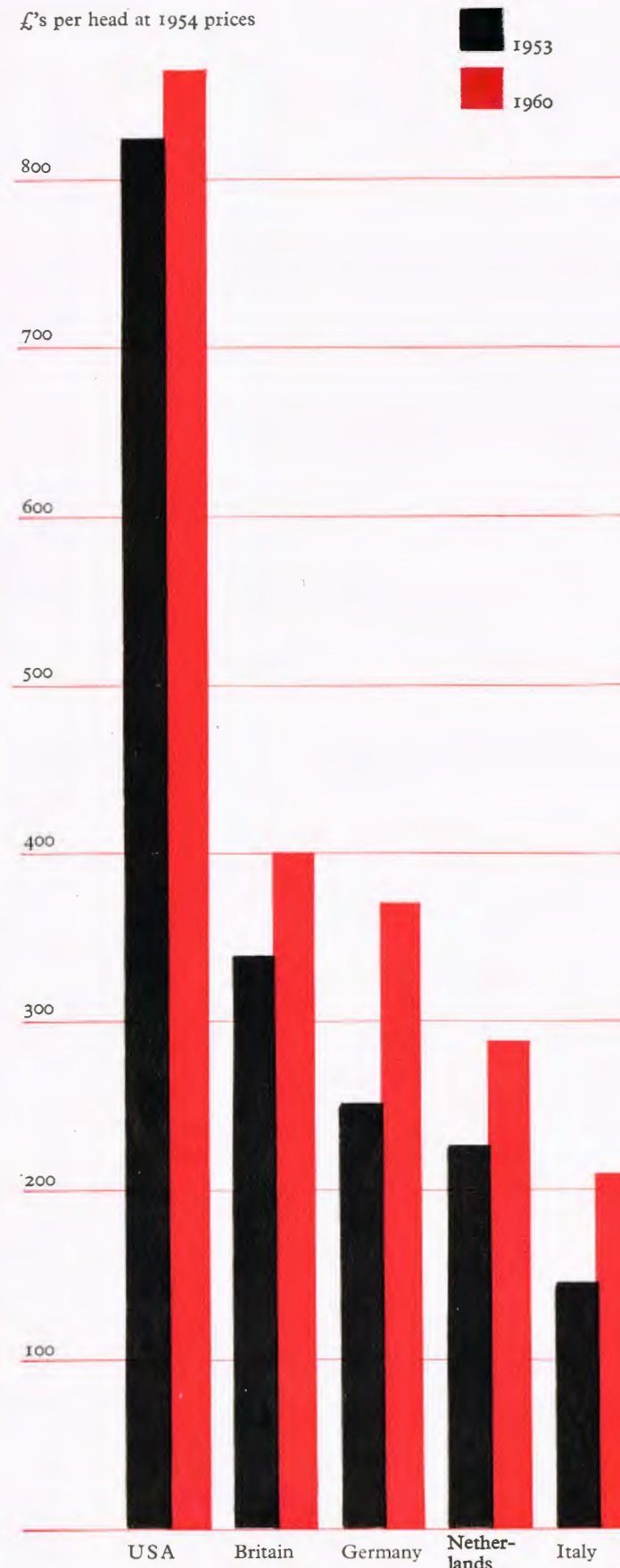
But the Europeans have not been content to rest at the level they had known before the war. The momentum has carried them on, and since 1953 most of the West European countries have continued to forge ahead.

When these great developments were already firmly under way a further important stimulus was added by the formation of the European Economic Community, to which six countries—Germany, France, Italy, the Netherlands, Belgium and Luxembourg—subscribed under the Treaty of Rome, which was signed in March 1957 and came into force on 1st January 1958.

Rome Treaty

For those engaged in industry the most important feature of the Treaty of Rome is the plan for progressive abolition of tariffs and other restrictions on trade, thereby creating a common market. The original treaty provided for a gradual reduction spread over twelve years, but already this timetable has been speeded up. This means, for instance, that soon French motor cars will pay no duty into Germany, nor Dutch chemicals into Italy, and so on. From this freeing of trade the Community is bound to gain profit and strengthen its competitive position, because business will be able to go to the cheapest producer and the inefficient firms whose costly products have hitherto been supported by protection will either have to close, become efficient themselves, or be bought up by a firm capable of making them more efficient. Besides the elimination of tariffs other measures will be taken: a common policy for trade, agriculture and transport will be worked out, and the movement of capital and labour

£'s per head at 1954 prices



Prosperity in the 1950s. The United States remain far more prosperous than any other country. In Europe Britain is still ahead, but West Germany and the Netherlands are now close behind. This chart compares per head 1960 gross national product with that of 1953

between the six member countries will gradually be made free. The object of all this is a still greater expansion of production and increase in productive efficiency, and these will benefit everybody in the Community.

How long will this growth of prosperity in Europe continue? This is a much-debated question. Some say that activity will begin to slack off as wants become satisfied. For example, a man does not need two new houses, nor two TV sets: he will prefer to have more leisure. Moreover, labour is already beginning to get short in many parts of Europe, especially in Germany. These things are sure to put some brake on continued growth.

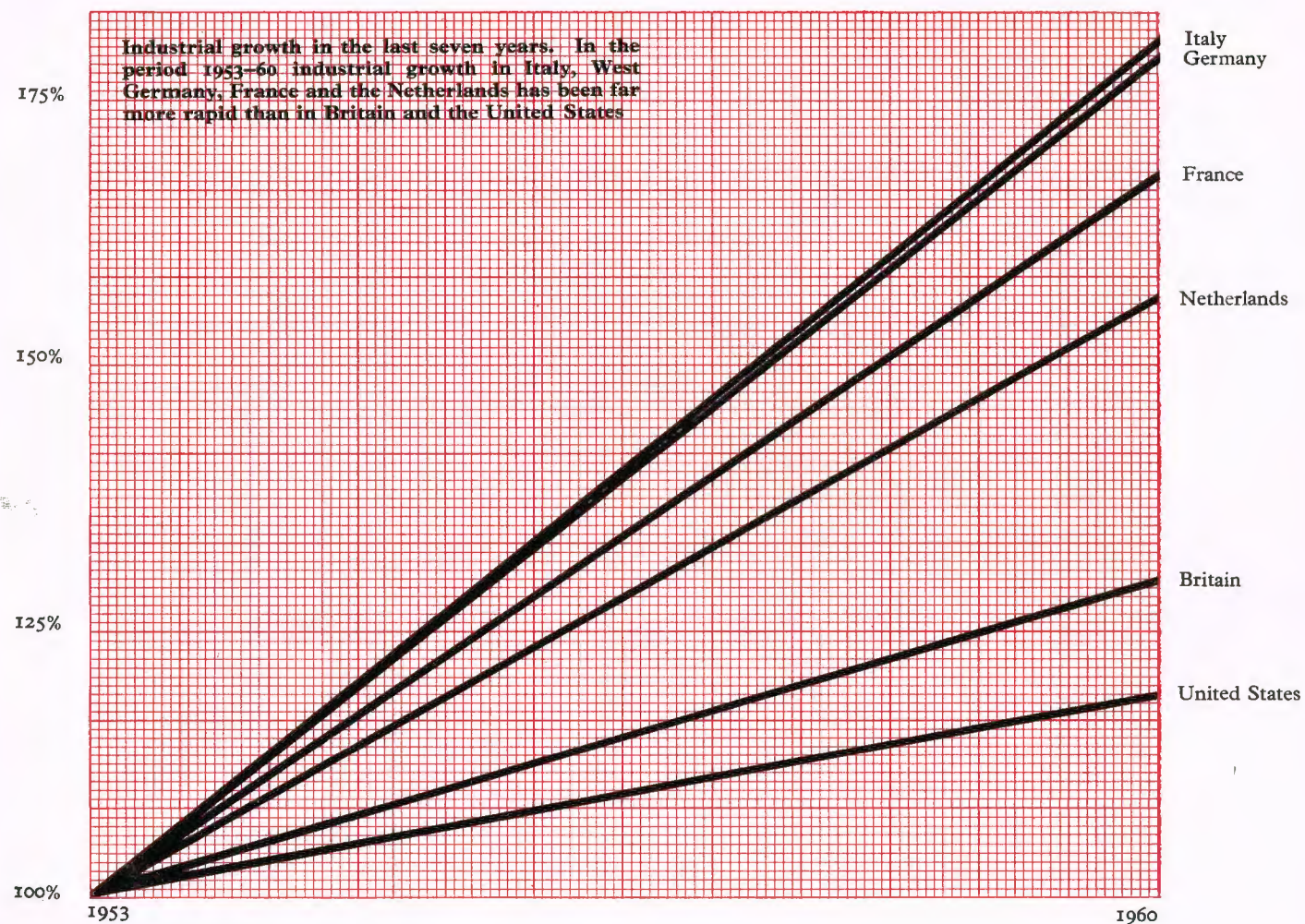
Living Standards

Others argue otherwise and compare Europe to the USA. Although Western Europe has by now more than regained its pre-war standard of living, and is approaching the standard we now have in Britain, this standard is only about half that of the USA. Western Europe has skills equal to the Americans and has a bigger population. Although it has fewer raw materials of its own, it has a much more compact geography. Why, then, should not Europe progress further until it nears the standards of American prosperity?

What does this huge and rapidly growing economy in Europe mean to Britain? It is a well-known fact that trade between highly industrialised countries grows fastest. Industries bring prosperity, which in turn create demands for specialised products from abroad as well as from home. This is most strikingly demonstrated by the growth of chemical trade between the six present member countries of the Common Market. This doubled between 1952 and 1956, and doubled again between 1956 and 1960. Hence the growing industrialisation of Europe can be expected to provide greatly increased opportunities for British exports. This trend, described in the Chairman's article in the December 1961 *Magazine*, is already becoming apparent: the value of British trade with the Continent has increased by a half in the last six years in spite of the tariffs against us. How much better, then, should we be able to do if Britain succeeds in joining the Common Market and we climb inside the tariff wall.

Let us now look at where ICI fits into this general picture and what ICI's prospects in Europe may be. In all highly industrialised countries the chemical industry is one of the most rapidly growing of all, and its progress is often nearly double that of industry as a whole.

This rapid growth of chemical production in Europe includes chemicals made for export outside the Common Market into countries where European chemicals are competing more and more strongly with ICI. Nevertheless, for the reasons given above, the expanding chemical market within the EEC has created expanding opportunities for ICI exports to the Continent of Europe. How ICI has responded is shown in the following table.



Value of ICI Exports (£ million)

	1950	1958	1959	1960
European Economic Community (the Six)	3.6	8.8	11.0	13.9
European Free Trade Area (the Seven)*	4.1	8.0	11.3	14.0
Rest of Europe	3.2	4.6	6.1	6.8
Total Europe	10.9	21.4	28.4	34.7
ICI total exports	48.4	73.8	87.5	96.6
Exports to EEC as % of total	7.4	11.9	12.6	14.4
Exports to Europe as % of total	22.5	29.0	32.5	35.9

* The seven: Austria, Denmark, Norway, Portugal, Sweden, Switzerland, the UK.

At the date of writing the figures for 1961 have not been released, but it is expected that they will show a further rise of 12½% in ICI's volume of exports to Europe, though the value of these exports has been only a little more than 1960, as prices have fallen owing to keener competition.

For some years past Europe has been by far ICI's most rapidly increasing export market. Indeed, ICI's business in Europe has been growing at about the same rate as that of our Continental rivals. But we must not be deceived by these substantial and steadily improving figures into complacency, as will be seen when they are put in their proper perspective.

The consumption of chemicals in the EEC countries was

of the order of £4200 million in 1960. This large total includes many "chemicals" which ICI does not manufacture, such as soaps and toilet preparations. ICI's exports to the EEC include products, such as metals and fibres, which are not strictly in the chemical field.

Moreover we have licensed processes such as polythene and 'Terylene' to some countries and therefore cannot export these products to them until the licences expire. And ICI manufactures a large tonnage of heavy chemicals of low value and cannot sell them competitively everywhere on the Continent as the high freight charges put us at too great a disadvantage compared to those who manufacture nearer to their customers.

If we make adjustments for these special factors and add freight, duty and other charges, our chemical sales in the EEC countries represent only about one half of one per cent of the Common Market business in that branch of the chemical field which we can supply at present. Looked at in this way, our share seems very small indeed. ICI is the largest and the most widely diversified chemical manufacturer in Europe, so it need hardly be said that this small share of the European chemical market, which is so near, so important and so rapidly growing, is not as good as it should be.

The Board of ICI decided in the early summer of 1960

that the time had come to overhaul the Company's policy towards Europe in order to achieve a substantial increase in our business there. A strong sub-committee was set up to make recommendations on the methods which ICI should adopt. Out of a series of meetings came some important conclusions.

First, it was necessary to define as clearly as possible the size of the target at which ICI should aim. Projecting the figures quoted above, and taking quite a conservative view of the future rate of growth of chemical business in Europe, it can be predicted that by 1970 the new business in the EEC countries alone will have a value of no less than £4000 million, and a further £750 million in the rest of Continental Europe. These vast sums can be understood better if we look at them this way; to supply this new market new chemical plants as big as the whole of ICI in Britain today will have to be built every year.

1970 Hopes

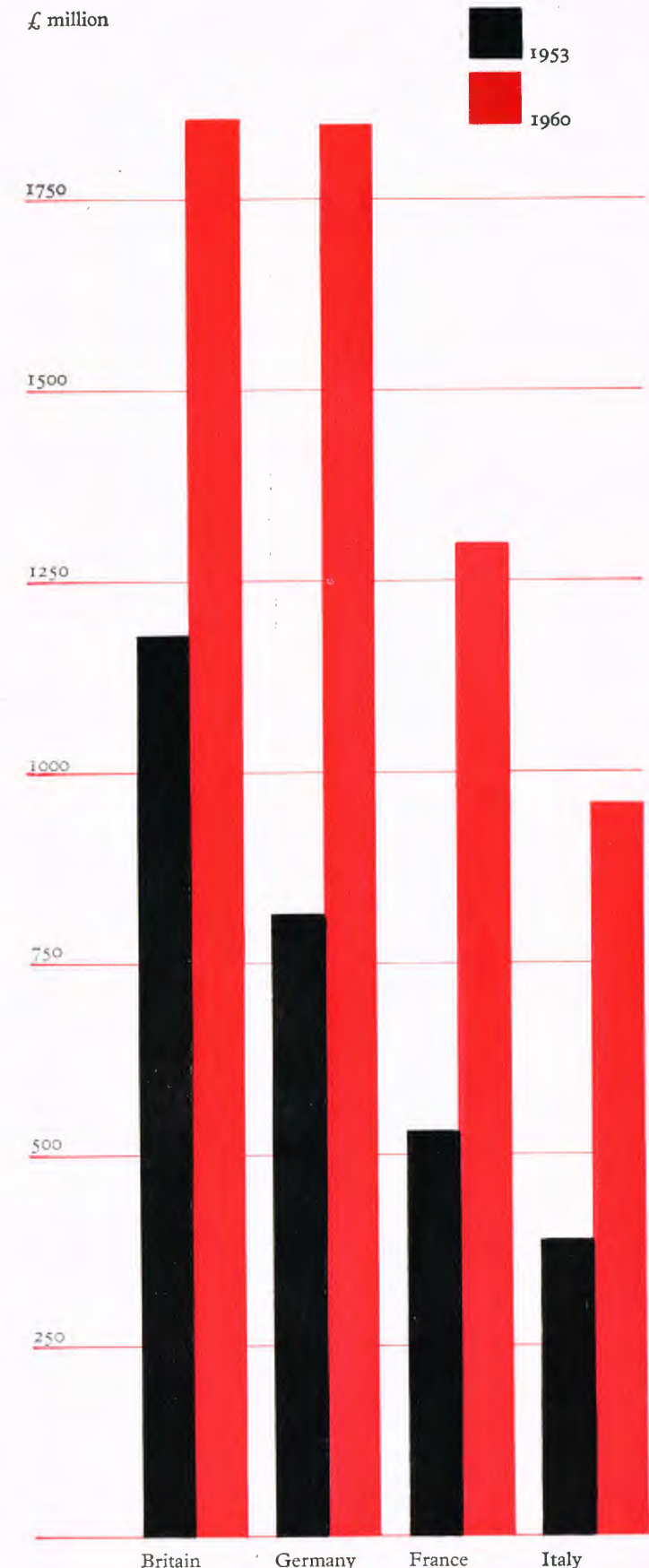
This is the size of the challenge. If we do no more than hold our present share of the European chemical trade in the products which we now sell, our exports to Europe will be almost doubled within a decade. But we are aiming to do much better. We have the foundation of our selling organisation throughout Europe on which we can build. We hope that before 1970 new discoveries will have been made in ICI's laboratories which will enable us to sell new products in Europe. Also, as our licences to the European manufacturers expire, we hope to renew exports of the products concerned. We must not forget that 1% of the chemical business in Western Europe will be worth £100m. in 1970.

Second, the Board recognised that to achieve these high ambitions ICI must be prepared to manufacture on the Continent, on a much bigger scale than we have done already, those products which for various reasons we cannot supply more cheaply from our existing or extended factories in the UK. Among the reasons may be cheaper raw materials, such as natural gas which we do not possess at home, or closer proximity to markets or better facilities for distribution. Moreover our Continental customers will naturally be more willing to place their business with ICI if they know that the supplies will come from one of our factories nearby. All these are reasons which could make us plan to manufacture in Europe, whether Britain joins the Common Market or not.

Birth of New Division

Finally, the Board decided that a new Division of ICI should be created and charged with the exclusive duties of developing these plans. This step has been taken: the European Council was formed in February 1961.

The progress which the Council has made in the year which has since passed will be described in the second of these two articles, appearing next month.



European expansion in chemicals. Chemical production in Western Germany has now caught up with that of Britain, and remarkable increases have been made by the French and Italian chemical industries

People and events . . .

1961 Profits and Future Prospects

ON 8th February the Board issued a press statement for the benefit of its stockholders which contained an eagerly awaited preliminary estimate of the ICI Group's profits for the year 1961. On the basis of unaudited accounts the group income for 1961 before taxation is expected to be about £62 million compared with £88 million for 1960, which was a record year for ICI. The Board will recommend a final dividend of 1s. 6d. for 1961 on the present Ordinary capital, maintaining the total dividend for the year at 2s. 9d. per £1 stock unit.

This reduction in profits for 1961 is attributed to three factors:

1. Substantial falls in world prices of certain chemicals—notably in some parts of the plastic field, where there were temporary surplus capacities, particularly in the United States, which had a direct impact on prices in Europe.
2. The Board's policy to anticipate Britain's possible entry into the Common Market by deliberately adjusting some prices which might not otherwise have remained competitive.
3. Difficult trading conditions in the United Kingdom and an increased proportion of our business being done in fiercely competitive overseas markets.

Although there was a fall in profit margins, the record volume of business achieved in 1960 was more than maintained in 1961, both at home and in exports. In particular ICI has increased its volume of exports every year for the past 8 years, and last year the f.o.b. value of these reached nearly £100 million.

The statement went on to deal with future prospects, with the warning, however, that these depend in part on factors quite outside the Company's control.

"We expect 1962 to be a better trading year than 1961, in which the maximum impact of surplus capacity was felt. The improvement will be mainly in the second half of the year, and our present forecast is that the 1962 profits should be appreciably higher than those of 1961. Beyond 1962 we expect the trend of profits to be upwards, and indeed we expect the record profit of 1960 to be exceeded within the next two to three years, with the trend continuing upwards. ICI has now £80

million invested in plants under construction or not yet in commercial production, all of which will in due course contribute to profits, either because they will meet the increased demand referred to earlier or because they will enable ICI to reduce its production costs by the adoption of new processes and cheaper raw materials.

"The ICI Board sees no reason why ICI should not maintain the same rate of growth, with a substantial increase in profits, during the present decade as it did during the last. We should draw your attention to the fact that as a result of progressive increases in the ICI dividend, the effective dividend on ICI Ordinary Stock has more than doubled since 1956 and that there has not been a reduction in any ICI dividend, either interim or final, for over a quarter of a century."

At the same time as the statement for its own stockholders was issued, it was also announced that the ICI Board had given final approval to the formal offer documents to the stockholders of Courtaulds. The four-for-five Ordinary share exchange offer stands with, as an alternative, an offer of £25 6½% Convertible Unsecured Loan Stock 1972/77 of ICI for each £10 of Courtaulds Ordinary stock.

Our Safest Year

THE year 1961 was the best yet for accident prevention within the Company. Payroll accidents causing lost time fell from 676 in 1960 to 616 last year and the frequency rate came down from 0.43 to 0.40. Put at its simplest, this is a reduction of nearly 10% in the accident rate—a splendid effort.

However, to prevent us getting too complacent Safety Department point out that this achievement still meant that

throughout the whole of 1961 there were, on average, between fifty and sixty people away from work because of factory accidents, and even more regrettably, four people lost their lives at work.

Outstanding among many good performances were Castner-Kellner Works' all-time record of 5,039,264 man-hours without a lost time accident and Derby Works' run of seven years accident-free (representing nearly 1½ million hours).

New ICI Secretary

MR. A. G. Woods, who has been an Assistant secretary of ICI since 1946, is to succeed Mr. R. A. Lynex as ICI secretary when the latter retires at the end of the month. He is 52.

Mr. Woods, who now lives in Downshire Hill, Hampstead, was born in St. Helens, Lancashire, in 1909. He was educated at Cowley School, St. Helens, and at Trinity College, Cambridge, where he took a degree in economics. After coming down from Cambridge he was articled to a St. Helens firm of solicitors and qualified in 1934. He then joined the Surrey County Council as a junior assistant solicitor. He was in practice for only a short time, however, and in 1936 joined the Alkali Division as assistant secretary, where he was until the outbreak of war in 1939.



Mr. Woods

After serving in the Army from 1939 to 1945 he came back to the Secretary's Department at Millbank, and in 1946 he became an assistant secretary, a post he has held until now.

Mr. Woods is married and has one daughter, aged 20.

New Scottish Plant

PLASTICS Division have started construction at their Dumfries factory of a new plant for the commercial production of polypropylene film.

The plant is expected to be completed by the middle of 1963. It will have a capacity of several thousand tons, and when fully operative will employ about 170 people.

Until the Dumfries plant has been completed, quantities of polypropylene film will be made available from the Division's pilot plants for market development purposes. Plastics Division already produce 'Melinex' polyester film at Dumfries Factory.

Beryllium Plant to Close

THE Beryllium Plant at Witton, specially built by Metals Division to supply beryllium components to the United Kingdom Atomic Energy Authority for fuel elements in its experimental advanced gas-cooled reactor, is to cease production about the end of June.

Since the plant was started in 1959, big improvements in the large-scale manufacture of this relatively new and technologically unknown metal have been achieved, the specifications of the Authority have been satisfied, and programmed rates have been met. However, the AEA have informed Metals Division that, despite every effort, serious technical difficulties still remain in the use of beryllium for fuel elements, and as a consequence they have had to cut back their programme. The decision to close the plant at Witton has been taken because, by the time the obstacles to the use of beryllium have been overcome by the AEA, plant of different design may well be required. The market for beryllium for uses other than in nuclear reactors is as yet undeveloped outside the USA.

About 200 employees at Metals Division are effected by the decision. Every effort is being made to find them alternative work.

Burns Night at Gomia

AT Gomia explosives factory in India, with its Scottish links, it is not surprising that there is an annual Burns Supper. Indeed, since the first was held in 1958 there has never been a miss. This



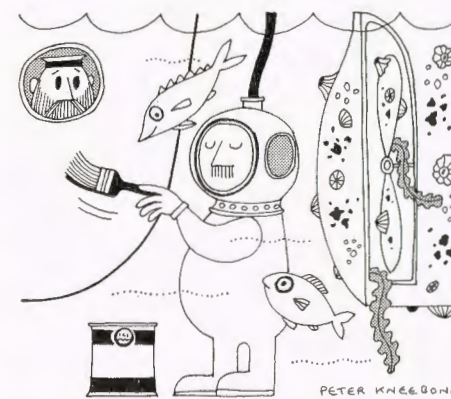
Piping in the haggis

year's supper was held on 19th January so that Mr. W. D. Scott, ICI Commercial Director, could be the guest of honour.

Last year Pipe Major Jimmy Cramb (Nobel Division), out in India as one of the Gomia starting-up party, provided the musical honours. This year it seemed in doubt whether the haggis would have the musical respects which are its due. The problem was resolved when a neighbouring army unit released a Gurkha piper for the occasion.

Cutting the Barnacle Bill

DURING 1961 there was a spectacular increase in sales, particularly overseas sales, of 'Alloprene,' the chlorinated rubber made by General Chemicals Division. One of the principal uses of this powdery resin is in making chemical- and corrosion-resistant paints. These paints are really tough and withstand conditions that would knock the stuffing out of ordinary high-quality paints. They are used, for example, to protect steelwork in



chemical factories and structures exposed to severe weather conditions, like the sphere of the atomic reactor at Dounreay on the bleak north coast of Scotland.

A fast-developing outlet for 'Alloprene' is in making marine paints. Ship owners are pretty conservative folk and for years

have continued to use the same old paints on the bottoms and hulls of their ships, despite the poor performance obtained. But recently, due partly to the increasingly high labour costs of painting, it has become expedient to use much more durable paints.

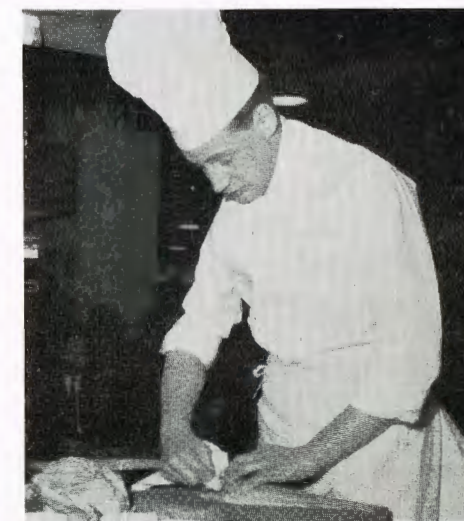
Rotterdamsche Lloyd—a well-known Dutch line—have recently adopted chlorinated rubber paints for all their new ships. This decision followed trials on one ship, the *Schelde Lloyd*, lasting 32 months, from which paints based on 'Alloprene' emerged triumphant. A significant point noted from the trial was that, due to the absence of corrosion and marine growths on the ship's bottom, fuel bills were reduced by 15%.

Marine paints based on 'Alloprene' have already been adopted by other shipping lines, including the British Blue Star line, and are being investigated by numerous others at home and overseas. Significantly, 29 tons of hull paints based on 'Alloprene' have been used on the new giant liner s.s. *France*.

Hotelympia Début

A HEAD OFFICE catering section trainee, Mr. Trevor Bell, was one of the 1000 entrants from Britain and abroad who competed in the Salon Culinare at last month's Hotelympia exhibition in London. In his first attempt at a national competition he entered for one of the classes in the senior salon, where he was in open competition with experts from all over the country. The dish to be prepared was *sole bonne femme*, one of the classic fish dishes, and to give some idea of the competition he was up against one of the prizes was carried off by a chef from the Dorchester Hotel, London.

Mr. Bell, who is 24, trained at Huddersfield College of Technology, and he



Mr. Bell

worked for the Trust House organisation and in France before joining ICI in 1961. He is at present spending three months with the Dyestuffs Division as part of his training programme.

Mr. R. L. Stinton, ICI chief catering adviser, judged two of the classes.

Coke Ovens Close

FOR more than 30 years the coke ovens at Billingham have been an essential part of the factory's ammonia process. Now they stand cold and lifeless. Their usefulness has ended as Billingham prepares to go over to a process using oil, a modern process developed at Billingham and claimed to be the most efficient in the world for making gas for ammonia manufacture.

The coke ovens were closed on 16th January, when the last oven was "pushed" and for the last time white-hot coke cascaded into the quenching car. The electric coke car trundled it at funereal pace into the quenching tower and for the last time white clouds of steam billowed into a grey winter sky.

The final "push" was watched by quite a crowd, from members of the senior management down to some of the office



Mr. Stoves

girls. Operating the giant electric ram to push the charge of coke from the last oven was 60-year-old **Mr. George Stoves**. He had pushed the first charge in 1929.

Baby Brother

PAINTS Division, which introduced the 'Dulux' Matchmaker tinting machine last year, is now bringing out a smaller version—the Mini Matchmaker. It is small enough to stand on a paint shop counter (or even, as shown, to fit into a Mini Minor van), and yet it will mix a range of 100 shades in gloss, eggshell or emulsion finishes.



The Mini Matchmaker in a Mini Minor

For gloss finishes, which need a tinted undercoat, this too can be mixed by the machine. The Mini Matchmaker will be distributed to many paint retailers up and down the country during 1962.

Top Marks

TOP marks for the whole of the country is the distinction achieved by **Douglas Robson** in the City and Guilds final examination in plumbing. Now in the last year of a craft apprenticeship at Billingham, Douglas is at present in the section of the Engineering Department drawing office which deals with heating and ventilation. He will be 21 in April. Around 2000 candidates sat the final examination.

Douglas's achievement wins him a money award given by the Land Development Association in conjunction with the City and Guilds organisation, and this was presented to him on 19th January.



Mr. Robson

G3HPP Calling

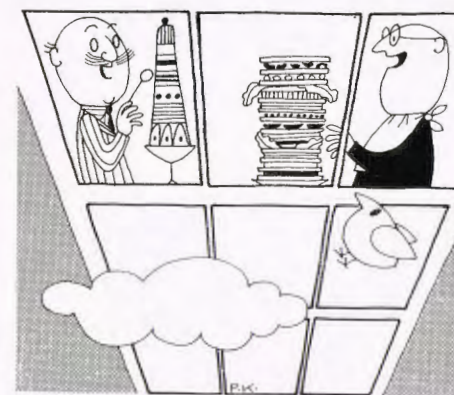
AN amateur radio station using the call sign G3HPP will be a feature of the Kynoch Works Centenary Gala on 2nd June. The station will be set up and operated by members of the Kynoch Radio and Television Society of Metals Division, and other local amateurs and will be on the air continuously from 2 p.m. on that day.

It is hoped to operate on all the amateur frequencies, and while all contacts will be welcome, they will be particularly interested in stations operated by employees of the Company.

Licensed amateurs within the Company are invited to get in touch with **Mr. E. O. Wright** (G3ICX) (Engineering Services, Metals Division, Kynoch Works, Witton, Birmingham 6), who will be pleased to arrange a sked.

Skyscraper Offices

THE Northern Regional and Manchester Area Offices of the Home Sales organisation are to move to the top twelve floors of a 29-storey tower block now being built in the Piccadilly centre, Manchester.

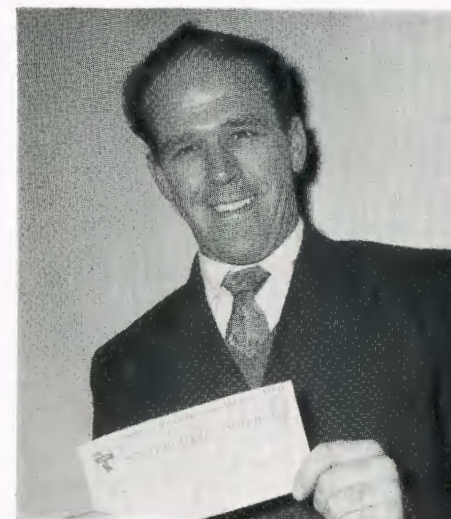


All ICI sales departments in Manchester will be brought together in one building as a result of this move. The new office will replace five premises in Manchester—in King Street, Deansgate and Brazennose Street, St. Ann's Square and Canal Street.

It is expected that the new offices will be ready early in 1963. Plans for their occupation are already taking shape; a luncheon club for the staff will be provided on the 29th floor of the tower block which will enjoy sweeping views of the city and beyond.

£150 Award

A 33-YEAR-OLD intermediates operator on the 'Terylene' Works at Wilton, **Mr. John Morren**, stepped into the office of **Dr. W. E. Tetlow**, assistant



Mr. Morren

works manager and works manager designate, Kilroot, expecting to receive a few pounds for an idea he had submitted under the Works Suggestion Scheme. A few moments later he emerged with a broad smile and a cheque for £150 tucked in his pocket.

The suggestion which earned him the £150 award was a simple modification to prevent the wastage of glycol.

"I expected to get about £20 or £30 for it," said Mr. Morren after receiving the cheque from Dr. Tetlow. "I didn't think the amount would be as large as this."

When he presented the cheque, Dr. Tetlow described Mr. Morren's suggestion as a very sound idea and offered his sincere congratulations and those of the Works Suggestion Awards Committee.

It is the second time that Mr. Morren has received a suggestion award, the previous one netting him £12 10s. several months ago.

Gardeners' "Must"

A NEW handbook for gardeners produced by *Good Housekeeping* in co-operation with Plant Protection Ltd., who market ICI Garden Products, is now available.

Most of the writing is by Clive Procter of PPL's Publicity Department, and there is a foreword by Percy Thrower, who contributes the garden articles in the *Magazine*.

The book, with over 300 illustrations—many of them in colour—presents a visual step-by-step approach through the whole gamut of gardening—planning, soil care, choice of plants, how to grow vegetables and fruit, and lawn care, as well as many pages of advice, written in non-technical language, on other subjects including how to deal with plant pests and diseases.

By any standards this is an attractive "must" for any gardener's bookshelf.

In Brief

'Propathene' prices. The home market prices of 'Propathene,' Plastics Division's brand of polypropylene, have been reduced by 4d. per lb. to 2s. 8d. per lb. for 10 ton lots of general-purpose granules. The new prices came into effect on 8th January.

Gold awards. Five more ICI boys have gained the gold standard of the Duke of Edinburgh's award. They are Michael Dutton (Alkali Division), Brian Ellis (General Chemicals Division), and Roger Eden, Ronald Gibbs and Leslie Kelly (Metals Division).

Golden wedding. Mr Billy Snape, who retired from the Metals Division Buller Shop at Witton in 1956 after 48 years' service, celebrated his 50th wedding anniversary on Christmas Day, 1961.

Royal Society. Lord Fleck, treasurer of the Royal Society, has been reappointed one of the vice-presidents of the Society for the year ending 30th November 1962.

Design prize. A 'Propathene' cistern has achieved a major success in the Australian Industrial Design Competition, the F. H. Edwards Laurel Award. Solid silver laurels, valued at over £100, are awarded to the winner of each of three sections in this annual award. The cistern, made by Industrial Products Ltd. of Adelaide from 'Propathene' made in Britain by Plastics Division, gained first prize in the consumer section.

Titanium prices. Metals Division has made further major reductions in the basic prices of its wrought titanium. This is the sixth substantial reduction since ICI began selling wrought titanium in 1954.

Bed at Broughton House. On 4th January Mr. R. W. Sutton, chairman of Blackley Works Council and works manager of Blackley Works handed over a cheque for £1000 from the ICI (Blackley) Comforts Fund to the chairman of Broughton House, the East Lancashire home for disabled soldiers and sailors, to endow a bed there. The money was raised by weekly contributions from payroll and staff employees at Blackley Works and at Dyestuffs Division headquarters.

Busy year ahead. An attractive and efficient young secretary with Lightning Fasteners Ltd. at Witton, Miss Dorothy Bass, was recently awarded the title "Miss Young Conservative 1962" at the annual ball which was attended by Young Conservatives from all the Birmingham branches of the Association.

Engineering honour. Mr. H. S. Sayles, Works Engineer of Nobel Division's Ardeer Factory, has been elected a vice-president of the Institution of Plant Engineers.

Safety Cup. The inter-Divisional Safety Cup has been won for the year ending 31st December by Plastics Division, who

improved their accident frequency rate by 18%. This Division was placed second twice in 1960 and was a joint winner in 1952. Nobel Division took second place with a 14% reduction. Paints Division, which includes ICI (Hyde) and who won the competition a year ago, were third, with a 10% reduction.

New paint guide. A new version of the 'Dulux' Colour Planner, which for the first time includes advice on the right paint for the job, is now available free from all 'Dulux' stockists.

New insecticide. Plant Protection Ltd. announced at the end of January the discovery of a new systemic insecticide—menazon—which kills the aphid which carries the potato virus. It is the safest form of systemic insecticide available in this country.

Remploy director. The Minister of Labour has appointed Mr. E. A. Bingen, a deputy chairman of ICI, to the board of Remploy, the non-profit-making company which provides sheltered employment for the severely disabled.

Third million. Research Services Department at Billingham were recently awarded a third million-hour plaque for their safety shield. They have not had a lost time accident since October 1960 and are now well on the way towards a quarter-million accident-free hours in their second successive million.

Golden eye awards. Three Billingham employees recently received Golden Eye badges for having saved their eyes from injury because they were wearing goggles. They are Messrs. Stirman, Edwards and Robinson.

Catering conference. The ICI catering conference for catering managers and managers from the Company's catering units was held in London last month. A visit to the Hotelympia exhibition was included in their programme. The conference, which was opened by Mr. C. M. Wright, ICI personnel director, was attended by over ninety Divisional representatives.

Painter's award. Mr. John Wood (General Chemicals Division) has been awarded the student of the year trophy at the Liverpool College of Art (Department of Painting and Decorating).

'Terylene' on show. Spring and Summer fashions in 'Terylene' were displayed at Fibres Division's London office on 12th February. A special feature of the show was 'Terylene' lawn. Similar fashion shows will be held in Hull, Middlesbrough and Newcastle during the first fortnight of April to back up retail store promotions. All garments shown will be on sale at the same time in the local shops.

Cover Comments

BOTH back and front covers of the *Magazine* came under close scrutiny by our readers last month. Due to our change in policy for cover pictures announced in the December issue, the front cover now aims to tie in with the leading article. Some readers may have

missed this mention, and we received several enquiries about the "Cars in ice" picture on the front cover, which was described in the foreword to the chlorine article—chlorine being one of the intermediates for anti-freeze.

Yet other readers have been quick to spot our unfortunate error which appears in the caption to our back cover photograph. Altdorf is in Switzerland (not Austria as stated), and the well-known statue of William Tell, the legendary hero of the liberation of Switzerland from Austrian tyranny, stands in the market place there. Close to it is the old tower, seen in the background of our photograph, on which there are rough frescoes commemorating Tell's feat.

One startling communication received by teleprinter read as follows:

THE BACK COVER OF YOUR LATEST ISSUE FEATURING WILLIAM TELL OF ALTDORF AUSTRIA IS A STUDIED INSULT TO STRUGGLING SWISS NATIONALISM. DEATH TO THE ITALIANS.

ANDREAS HOFER, ZUERICH This ghostly message, we assume, was prompted by fellow feeling for Hofer, the Tyrolean patriot, who also rose up and fought against foreign oppressors. He was finally captured by Italian troops and executed in Italy in 1810.

After Anna

LAST month a sequel to the story made famous by the film *The King and I* appeared in the bookshops. Called *Fanny and the Regent of Siam*, it is published by Collins and costs 30s. Its author is R. J. Minney, whose most recent book and film success was *Carve her Name with Pride*. Credit for the original idea for the new book, however, goes to Mr. W. S. Bristowe, head of Central Staff Department.

Mr. Bristowe stumbled on the intriguing story of Fanny Knox when out in Siam back in 1930 on a business trip for ICI. In Bangkok he met a Dr. Carthew, who had been in medical practice in the city for many years and who had known Fanny well.

Fanny was the daughter of Sir Thomas Knox, British Consul-General in Bangkok. The link with Anna Leonowens is through the latter's son Louis, who was at one time a suitor for Fanny's hand and who later married her younger sister Caroline.

At the time of his meeting with Dr. Carthew, Mr. Bristowe made some notes. He remembered them when, many years later, a play and two successful films were made about Anna. He was inspired to carry further his own researches on Fanny Knox and spent much spare time studying among the Foreign Office files and other

documents of the period. He also spent a holiday in Bangkok doing further research.

Convinced as a result of this that there was an exciting story to be told but lacking the time to write the book himself, he inspired Mr. Minney with his own enthusiasm for the subject.

However, the publication of Mr. Minney's book is probably not the end of the story. After he retires at the end of the year Mr. Bristowe hopes to find time to write a biography of Louis Leonowens, Anna's son, who is one of the minor characters in the present book.

Black Monday

IN one year alone over 170,000 people are hurt in industrial accidents in Britain. Most of them, as you might expect, happen on the factory floor or down the mines, but offices and laboratories are by no means exempt, as *Black Monday*, the latest production of the ICI Film Unit for Central Safety Department, shows.

The film was shown to an invited audience of industrial journalists and safety experts at Millbank last month. It is set in a research laboratory, and its characters are trained research workers well aware of the need for safety precautions. The job they undertake is a routine chemical operation, which they have done dozens of times before without incident. On this particular occasion, however, it ends in disaster. It is fiction—but it could, all too easily, be fact.

The script for *Black Monday* is the work of James Hill, who recently directed the film version of Arnold Wesker's play *The Kitchen*.

Appointments

Some recent appointments in ICI are: **Alkali Division:** Mr. C. G. Crill, Education Officer; Mr. F. W. N. Masters, Works Manager, Weston Point Salt Works (in addition to his duties as Works Manager of Winsford Salt Works). **Billingham Division:** Mr. G. T. Britton, Casebourne Works Manager. **Head Office:** Mr. J. D. Cousin, Mr. D. G. G. Haffenden and Mr. V. M. Robson, ICI Assistant Secretaries (Mr. Haffenden is returning to this post after secondment to Central Labour Department); Mr. A. G. Woods, ICI Secretary. **Nobel Division:** Mr. R. J. Bown, Director responsible for Sales and Technical Service (Explosives Products); Mr. J. C. B. Carnegie, Home Sales Manager, Explosives Sales Department; Mr. H. Fitzpatrick, Assistant Accountant (in addition to Mr. A. G. Mitchell); Dr. J. S. Flanders, Director responsible for Sales and Technical Service (Chemical products, excluding silicones); Dr. A. C. Hutchison, Sales and Technical Service Manager, Chemical Sales Department; Mr. I. H. Paterson, Overseas Sales Manager, Explosives Sales Department; Mr. M. G. Thomson, Safety Officer; Dr. R. Westwater, Technical Service Manager, Explosives Sales Department. **Pharmaceuticals Division:** Mr. W. Grayson, Assistant Accountant; Mr.

D. M. Lintott, Deputy Chief Accountant. **The Regions:** Mr. J. A. C. Burnand, Commercial Service Manager, Midland Region; Mr. J. Crosbie, Personnel Manager, Midland Region. **Canadian Industries Ltd.:** Mr. W. T. D. Ross, Vice-chairman. **Chemicals and Fibres of India Ltd.:** Mr. G. W. Shaw, Director (in addition to his duties as Engineering Manager of ICI (India)). **ICI (India):** Dr. C. E. Salkeld, Director (in due course to be located in Bombay with specific responsibility for the polyester fibre project). **ICI (Malaya):** Mr. M. R. Cato, Director; Mr. H. G. Owen, Managing Director. **Indian Explosives Ltd.:** Mr. D. B. Mohindra, Director. **Khewra Soda Co.:** Syed Wajid Ali Shah, Non-executive Director.

Retirements

Some recent announcements of senior staff retirements are: **Alkali Division:** Dr. J. F. Lehmann, Works Manager, Weston Point Salt Works (retired 31st January); Dr. J. Muir Smith, Education Officer (retiring 30th June). **Billingham Division:** Dr. D. Clayton, Engineering Developments Manager (retired 31st December); Mr. C. C. Skou, Casebourne Works Manager (retired 31st December). **Head Office:** Mr. R. A. Lynex, ICI Secretary (retiring 31st March). **Nobel Division:** Mr. J. J. Tidd, Safety Officer (retired 31st December). **The Regions:** Dr. W. A. P. Challenor, Commercial Service Manager, Midland Region (retiring 31st March).

50 Years' Service

The following employees have completed 50 years with the Company. **Alkali Division:** Mr. G. Hambleton, Buxton Lime Works (5th February); Mr. S. W. Leicester, Winnington Works (19th February). **General Chemicals Division:** Mr. G. H. Furfie, Castner-Kellner Works (12th February).

Obituary

Mr. J. C. A. Chivers Mr. J. C. A. Chivers, works manager of Dye-stuffs Division's Huddersfield Works, died suddenly in the early morning of 3rd January. He had been at work as usual on the previous day, apparently in the best of health. He was 56 and had been works manager at Huddersfield, the largest chemical works in the Commonwealth engaged solely in the manufacture of organic intermediate chemicals, since 1955. His whole working life had been spent with the Company, which he joined as a chemist from King's College, London, in 1927, and almost all of it at Huddersfield. He began on the research side but after several years moved over to work study when he was sent to Grange-mouth Works to assist in the installation of a measured work incentive scheme there, returning to Huddersfield in 1932 to take over the Leadership of the Work Study Department. Four years later he moved to the Intermediates Department, becoming head of the department in 1943. In 1948 he was appointed assistant works manager and in 1953 works manager of Trafford Park Works. He returned again to Huddersfield as works manager in March 1955.

A colleague writes:

"In the Company Mr. Chivers built up an unrivalled reputation for wisdom in works management, and all those associated with him learned to appreciate his humane and realistic handling of affairs. His interest in people and things extended outside the Works, shown by his long association and keen interest in the Brunswick Boys' Club, Huddersfield, and the Union Discussion Society. He never spared himself in the interests of the Company or in the interests of those under his command. He will be sadly missed."



THE next few weeks are, I think, a rather treacherous period: the weather tempts us to get on with so much and then suddenly turns bitterly cold, and we may be back where we started.

The plum blossom so often denotes what we call a blackthorn winter, a cold spell just when we could do very well without it. The blossom on the wall-trained plum trees, as well as the peaches and nectarines, is now in flower. These we are able to protect, and the wall does give them quite a lot of protection, but the larger trees are almost impossible to protect at all. Both the plum and pear crops are dependent on the weather; so are the apples to a great extent, but these flower later and have a much better chance of coming through unharmed. We do of course get frosts in May, as we did last year, and when we do it is then that the apple blossom suffers.

Precautions against Frost

Strawberries are another fruit which depends on good weather. Being so near to the ground the flowers are very susceptible to damage from severe ground frost. If we have the straw nearby ready for strawing we can, if frost threatens, lightly place it over the top of the plants before we go to bed. Sheets of newspaper over the plants with a stone on each corner to stop them blowing away will also provide protection from frost damage. It is not a wise policy to put the straw round the plants too early, because this has the effect of stopping the warmth rising from the soil. It has been found that when strawing is done too early frost damage is far worse than on those plants left unstrawed.

Last year I tried the black polythene round strawberry plants. It certainly kept the fruits clean and reduced weed

Care of Strawberry Plants, by Percy Thrower

growth, but if it is put round the plants too early and becomes wet with rain it will tend to draw the frost and, like the straw, will prevent warmth rising from the soil.

Raspberries will soon be growing fast, and now is the time to feed to help them carry a good crop. Sprinkle an all-purpose organic-based fertilizer along each side of the row, allowing a handful for each yard of row. It must be kept away from immediately round the stems, because not only will it burn them but may also scorch the young canes which are beginning to grow from below soil level, and these we want for next year's crop. The fertilizer can be lightly stirred into the surface of the soil; to fork deeply would damage the feeding roots, as the raspberry is very shallow rooting. After stirring in the fertilizer some manure, compost or peat can be spread along the rows, more to conserve the moisture than actually to feed the raspberry. Now is the time to spray the raspberries too. Add a BHC insecticide to a fungicide, and as well as killing insect pests you will at the same time be controlling mildew and other fungoid diseases. While feeding the raspberries do the same with the blackcurrants, and not only will it help this year's crop, but it will encourage strong young growth for next year's crop at the same time.

Earth up Potatoes

In the vegetable garden or on the allotment the earliest planted potatoes will, in a matter of a week or two, be showing above the soil, and here again we must be wary of frosts. A little soil can be pulled up over the young tops, partially earthing them up, or they can be covered with newspaper at night time. Pea guards or black cotton will be necessary along the pea rows to keep off the birds, and as so

much damage can be done by field mice these must be either poisoned or trapped.

Along each side of the broad bean rows pull up a little soil to form a ridge end ready for the string to go along to support them when they are taller. The runner bean trench, if this has been open all the winter, can now be filled in with layers of manure or compost and soil to within six inches of the top. Do not mix manure with the top six inches, because the beans will be sown or planted in this.

More peas, lettuce, radish and salad onions can be sown to keep up a succession of crops, and Short Horn carrots and Globe beetroot can be sown early next month.

Hoe between the onion rows to keep down the weeds. Apart from this, the onions appreciate regular stirring of the soil. Onion plants raised under glass can be planted outside with the better weather next month; from these we shall get the large bulbs for the shows.

Time to Plant Out

In the flower garden it will soon be time to plant outdoor chrysanthemums, sweet peas and gladioli. The dormant dahlia tubers can safely be planted later next month—the tops of these will not be above the soil before the fear of frost has gone. Hardy annuals sown this month out of doors will need thinning during the next few weeks. This should not be too drastic to begin with; it is an easy matter to pull out more a little later when they are past the stage when slugs can harm them. Sticks can also be put round the most forward hardy border plants.

Generally speaking, there is a lot of work to be done outside, and we hope for good weather to get it done.

Training for Management

IF unsatisfied demand is a criterion of success, Warren House, ICI's London centre for staff training, certainly pays off. Six hundred men (and a few women) come to Warren House each year for training, and there is still a considerable waiting list. Here Mr. F. H. Perkins, ICI Education Officer, talks to the Editor.

EDITOR: *First of all, a background question. What is Warren House for, and how did it start?*

PERKINS: The need for a centre for Company staff training was first expressed in 1943 by Mr. A. J. Quig, then Commercial Director and later a Deputy Chairman of the Company. The idea slowly gained acceptance under a great deal of critical examination. But it was not until 1955 that we were able to have our opening ceremony. Some training on a Company basis had been going on at Millbank and elsewhere, so we knew that we wanted a largish house where we could conduct courses with as many as 27 members. We think this is the maximum. It provides for three groups or syndicates of reasonable size, and the right size of audience for talks and demonstrations. We ultimately found what we needed at Warren House, Kingston-on-Thames, a well-kept house in a most attractive setting not too far from London. The local administration of the house and grounds is in the care of the Warden, Captain M. E. Butler-Bowden, who came to ICI after a distinguished career in the Royal Navy. He acts as host, with the kind of quiet efficiency you would expect from a naval man. That is very important, you know.

EDITOR: *Can you state briefly the main purpose for which Warren House exists?*

PERKINS: It is to provide a forum for the dissemination of knowledge and the promotion of new ideas and attitudes that have a bearing on the policies and practices of our own Company. It is also to provide an additional channel of personal communication between those who formulate policies and those who operate such policies day by day. By involving the members of our staff in this process, particularly in their earlier years of responsibility, we believe we are providing them with valuable experience.

EDITOR: *Can you explain further?*

PERKINS: You see, on our courses people are freed from executive responsibility and this fosters frank discussion and the freest exchange of views, based on experience. But it would be wrong to imagine that the views expressed or ideas that arise and attract support remain within the precincts of the house. I think that most people agree that Warren House in its short

Who was right? How did we get overstocked? Reflection of the ICI Assistant Purchases Controller going through the details of a commercial problem with members of the course in the Conference Room

history has already had a material influence on the thoughts and actions of people who carry executive responsibility.

EDITOR: *That's very interesting—but have you a permanent staff who can impart the knowledge and disseminate the ideas you mention?*

PERKINS: No. That is the most interesting feature of the whole activity. I must emphasise again that Warren House provides a forum, which enables all members to contribute from the background of their knowledge and experience. Admittedly we invite senior members of the staff to give talks and lead discussions, but fundamentally it is the interaction of ideas and the process of debate among the members themselves, both in their syndicate meetings and informally, that really influence attitudes and behaviour.

EDITOR: *This method sounds rather leaderless and incoherent. Is it, in fact, so?*

PERKINS: I only wish I could say that all discussions in syndicates have been fruitful and effective. Everything is done, however, by the directing staff in preparation and planning to help syndicates make their discussions as effective as possible. We invariably include, at the beginning of each course, hints and guidance on how to take the chair and how to get the best results from a meeting. The directing staff are, of course, responsible for planning the course to meet specific needs and objectives, and for preparing the briefs which form the basis for syndicate discussions. They consist of three or four people who change from course to course, drawn mainly from ICI Headquarters and generally including someone from a Division or Region as well.

EDITOR: *It must be an expensive exercise. Is it worth while?*

PERKINS: Of course, I think it is well worth while. But I can't prove that the expense is more than offset by the benefits, because the benefits aren't measurable. You can't point to a man and say "He wouldn't have been able to do that difficult job if he hadn't been to that course at Warren House."

EDITOR: *Let me put it another way. Is it successful?*

PERKINS: Well, there is one criterion. Are our courses considered worth while by the people we run them for? Divisions, Sales Regions and Overseas units? About 600 people come to Warren House each year, and all our courses have been over-subscribed. So we believe that the top people in the Divisions and Regions have been impressed. They go on sending their men, often men whom it is not very convenient to release.

EDITOR: *The courses seem to fall into two groups: the more functional ones dealing with subjects like speech training and office administration, and those dealing with various aspects of management. You have something concrete to teach in the first group, but how can you actually teach better management?*

PERKINS: The courses you are referring to are only part of the



Photographs by John Timbers



"These two factors have to be weighed against each other." An ICI Assistant Treasurer discusses a syndicate's financial ideas for the launching of a new product



The "finance committee" of one of the syndicates hammers out its cash forecast



"Look, Jim, this is the kind of problem we all have to face." The "manager" tries his hand at guiding a valuable but awkward subordinate

whole process of staff training, and of course we don't aim to teach management, in the sense that we expect someone to blossom out as a fully competent manager after a fortnight at Warren House. We are just part of the big effort that's made in ICI to give people the right experience at the right time. If a man goes back to his job after a course with sound ideas firmly implanted in his mind we are well satisfied, even though they may not bear fruit immediately. As I explained earlier, we try to provide problems which the men can discuss with each other away from their jobs, and thus form some idea of what management is about.

EDITOR: Can you give an example of the kind of problem that's discussed?

PERKINS: It isn't easy to do that without going into detail. But here are two. The first is the simulation of a problem of personal relations—or, if you like, discipline. A senior man is not entirely satisfied with his immediate junior, and the junior man has a sense of grievance. An interview between them is enacted (or "role-played" as the books say) by members of the course, who have been provided with a great deal of background detail. Their performance and the situation it is based on are then discussed by the group. The object is to consider how the senior can be firm and yet fair, and how the junior can most reasonably put forward his own case. The student-chairman can then lead his group on to a broader discussion on advising and guiding subordinates—making them test any rash generalisations against the concrete situation which they dealt with first.

The second study concerns a company which is extending its field of manufacture. The change involves the operation of new technical processes requiring new plant and new knowhow. The resulting product will ultimately displace the most important item in the company's present output. The syndicates are asked to put themselves in the place of a board committee that has been set up by the company to consider such questions as exactly when the plants for the new product should be brought into operation, what will happen if the plants fail to produce enough to meet sales forecasts, how redundancies should be dealt with, and so on. The members have a good deal to read and digest, and then they discuss their plans in two sessions, extending to about three hours. Between the sessions, sub-committees of two or three members often make detailed studies of different aspects of the problem. Finally the syndicates produce their reports, which are duplicated and circulated to all members. Some days later each syndicate is visited by three senior men, each expert in one aspect of the problem—for example, engineering and contracts, staff and labour, finance and commercial matters. They deal with their specialities in turn, and in the end the men have been shown that they must learn to look at the whole of a problem, not just the engineer's side of it, or the accountant's or the chemist's.

EDITOR: What is the average age of the people on the various courses?

PERKINS: For some of the functional courses, the age range is wide. For the Staff Course, which is the one we have just been discussing, it tends to be around 35. Most members have been with ICI for about 10 years and are on the threshold of what you might call middle management.

EDITOR: Wouldn't it be better to catch people younger and deliberately train them for future responsibility?



Building better and cheaper plants. Discussion with a Division Engineering Director goes on long after the formal session has ended

PERKINS: Don't forget that Warren House is only part of the picture. Almost from the time they join the Company, promising men are moved about to give them wider experience and opportunities to develop their capabilities. That constitutes the larger part of their training for management.

EDITOR: I notice you run some courses for senior men—the Finance and Management Course, for example. Is this a new departure?

PERKINS: That course actually started in May 1960, and we now run two five-day courses a year, each attended by 18 people. They are men of Division Board level, or near it, whose experience has been mainly technical. They have learned to manage men, but have probably not had the opportunity or the time to gain a full understanding of finance as an essential part of management. The course is intended to make them think pretty seriously about such things as company finance, commercial management, taxation and overseas affairs.

As well as talks by some of the Company's senior accountants and tax experts, the course always includes some fairly complicated case studies. They are asked to assess the merits of a particular capital project, given the complete data and background. I can't give you an example, because the briefings run to about fifteen pages and include reams of figures. This study won't be a complete fantasy—it may be a problem very like one that the Capital Projects Committee of the ICI Board is considering at the time. One of the ICI Directors—usually Mr. L. H. Williams, who conceived the idea of the course—will probably talk to them and answer their questions at the end of the course. He won't be instructing them so much as giving them something to consider when they are back at their jobs. And it works both ways, because their arguments may start him on a profitable new train of thought.

EDITOR: Are all the speakers at Warren House ICI men?

PERKINS: In any one year several hundred members of the Company help us with their experience. But while we'd be fools not to tap the tremendous fund of good brains we've got in ICI, we have to be careful not to slide into any kind of complacency. So we also try to get fresh points of view from outside. Quite recently the managing director of a very large public company came down to talk to a course. His company is run on totally different lines from ICI, but no less successfully. So here we had a man who was saying, in effect, "You think you're pretty good—but we're pretty good too, and we do it quite differently." That's an excellent corrective to any smugness we may be guilty of, and it stimulated some very lively arguments.

EDITOR: The existence of Warren House suggests that centralised staff training courses are better than separate courses in the Divisions and Regions. Why is this?

PERKINS: I don't think your deduction is correct. There are Divisional and Regional courses in very great variety, and they form an important part of the whole Company programme. But you must remember that ICI is getting bigger and more complicated all the time. The more this happens, the more necessary it is to keep people in touch with each other and with what is going on in the Company as a whole. To take an extreme example: if it were not for the Staff Course, you might get the absurd situation in which a man had worked for a Division for more than ten years without ever actually meeting anyone from another Division. You'd be surprised how often an engineer or research chemist will remark to one of the directing staff at Warren House that the thing he's enjoyed most about his course is meeting a real live sales representative. He might never have had the opportunity otherwise. People tend to specialise in these days, because chemical manufacture has grown into such a diverse and technical business. This makes it important to bring them into the general picture at every opportunity.

Our Customers: No. 3

GLASS BOTTLE MAKERS

ICI's tie-up with the glassmaking industry is—through our parent companies—as old as the chemical industry itself. Out of every ton of soda ash made by one of Alkali Division's biggest works, 12 cwt. goes to the British glass industry.



No one quite knows when glass was discovered, but legend attributes it to the Phoenicians. The original method of producing holloware long before the birth of Christ was to wind the threads of glass round a core of clay and sand and, after fusing, to wash the core away. The method of blowing hollow glass by mouth on the end of a metal tube dates from just before the Christian era. This was the method of manufacture right up to late Victorian times, when a Yorkshireman named Ashley pioneered a machine method of manufacturing bottles by the blow moulding technique. This was followed in 1908 by the introduction into Britain from the USA of the first fully automatic glass bottle machine.

There are now about forty factories making glass containers in Britain. They are mainly in Lancashire, South Yorkshire, Scotland, the Midlands, and the London area. Our artist visited the Key Glassworks factory at Harlow.

The output from these factories is over 4400 million bottles and jars a year, and this is increasing all the time. The food and drink industries together account for about two-thirds and the pharmaceuticals industry absorbs roughly a fifth.

Ingredients for Glass

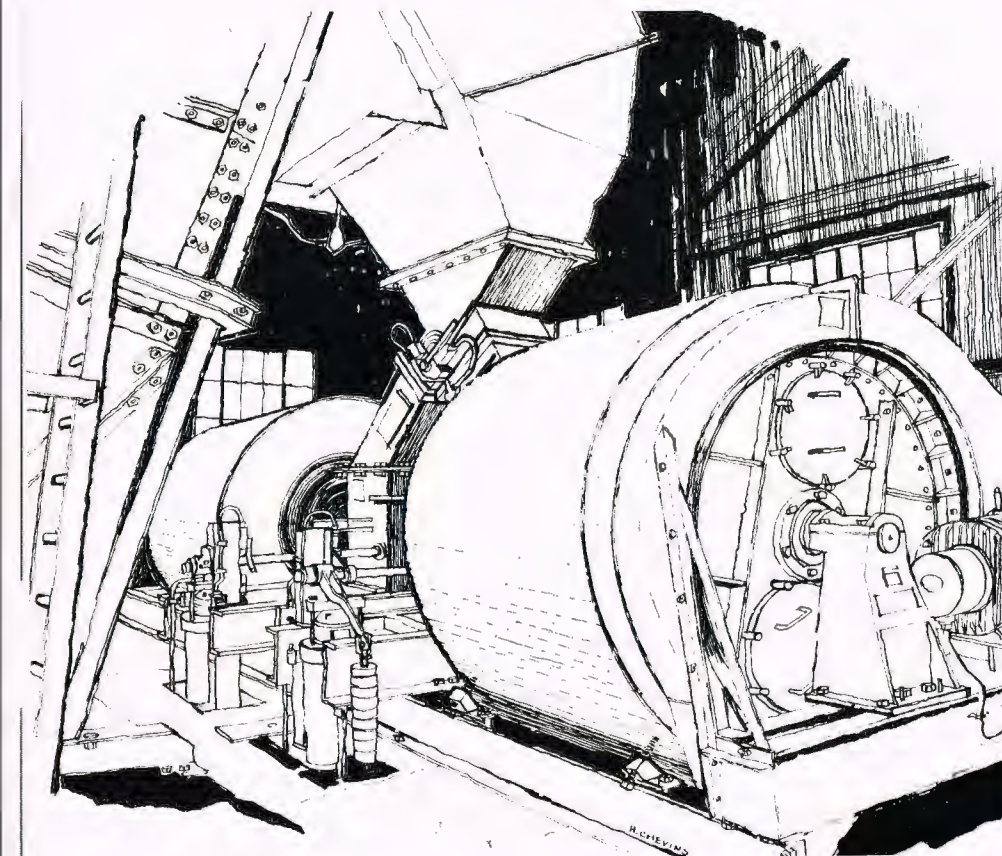
The main raw materials for glass-making are sand, soda ash and limestone. Our second picture shows the silos in which these raw materials are stored until needed. The most important, if you go by weight, is sand. In every batch (the trade term for the final mixture) which goes into the furnaces there are 100 parts of sand, 35 parts of soda ash, 22 parts of limestone, plus added cullet (broken glass) in various proportions. Cullet plays an important role in assisting the melting and binding of the raw materials. Inside the furnace the batch is heated to a temperature of about 1500°C, when it fuses and is transformed into a gleaming white-hot pool of liquid glass. The molten glass then passes on to the second zone of the furnace, where it is allowed to cool slightly.

The cooled glass, by now of a treacly consistency, flows through a feeder channel to a mechanical extruder. As it emerges it is cut into "gobs" by power-driven shears. Each gob falls into a waiting mould, where the neck is formed, and then passes to a finishing mould, in which it is blown to a shape. Finally the



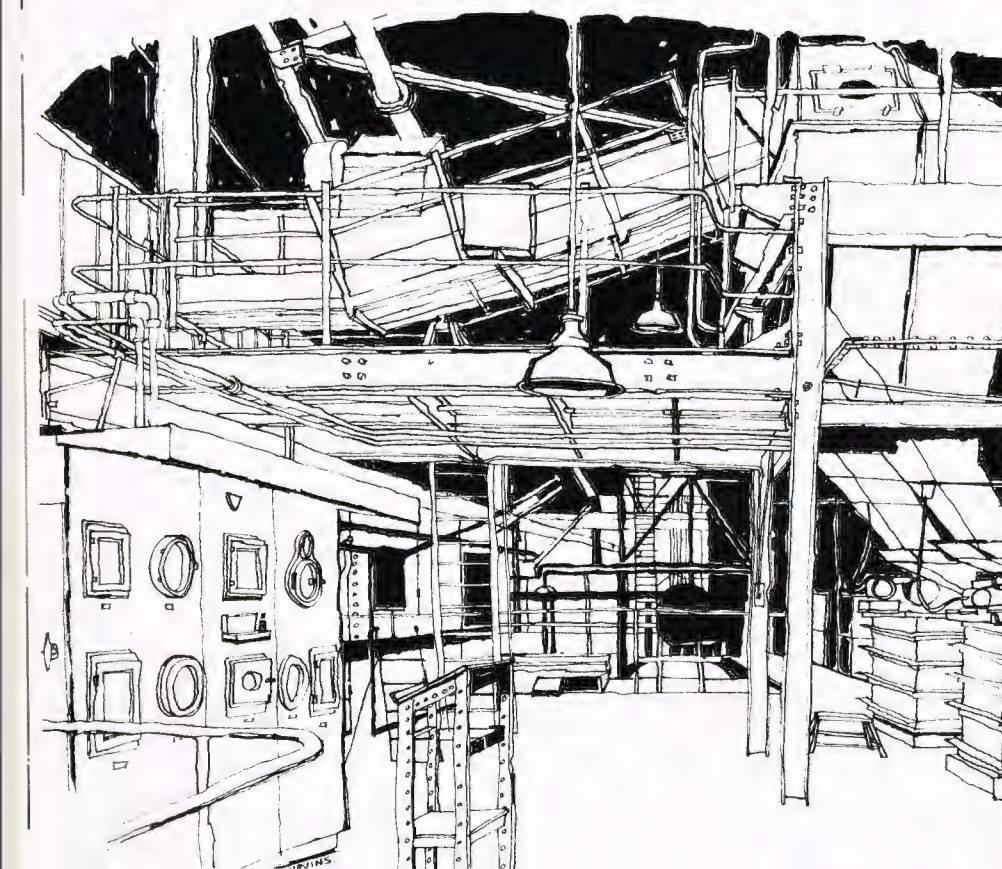
OPPOSITE: Raw materials for glass-making, among them soda ash from Alkali Division's Wallerscote Works, arrive by rail at the automatic handling and mixing plant at Key Glassworks Harlow factory

ABOVE: Sand, soda ash and limestone are the main raw materials of glass. The final mixture which goes into the glass furnace comprises roughly 100 parts sand, 35 parts soda ash, 22 parts limestone, plus added cullet



ABOVE: Blenders mixing raw materials for glass bottle manufacture. Besides sand, soda ash and limestone, small quantities of auxiliary chemicals from ICI are included

BELOW: A view of the melting end of a furnace, showing the control panel and raw material delivery. The furnace is heated to a temperature of 1500°C



bottles are annealed by cooling slowly. At Harlow the machines can turn out bottles at up to 200 a minute.

What is ICI's contribution? First and foremost there is soda ash. Wallerscott Works, one of the Alkali Division's factories, is the biggest works in the Commonwealth given over to this single chemical. Of every ton it makes, 12 cwt. goes to the British glass industry. And of this 12 cwt., two-thirds goes into the manufacture of holloware—anything from a minute vial for the pharmaceuticals industry to a 10 gallon carboy.

ICI have developed a dense granular grade of ash for the glass industry, since light ash tends to be blown away when it first enters the furnace, with loss and damage to the white-hot furnace brickwork.

Role of Auxiliary Chemicals

An interesting auxiliary chemical is oxalic acid from General Chemicals Division, which is used for removing iron compounds from sand. These give sand its characteristic yellowish-red colour and must be removed for the production of white glass, since they produce in it a green tinge. Extra iron compounds are added to produce dark green bottle glass.

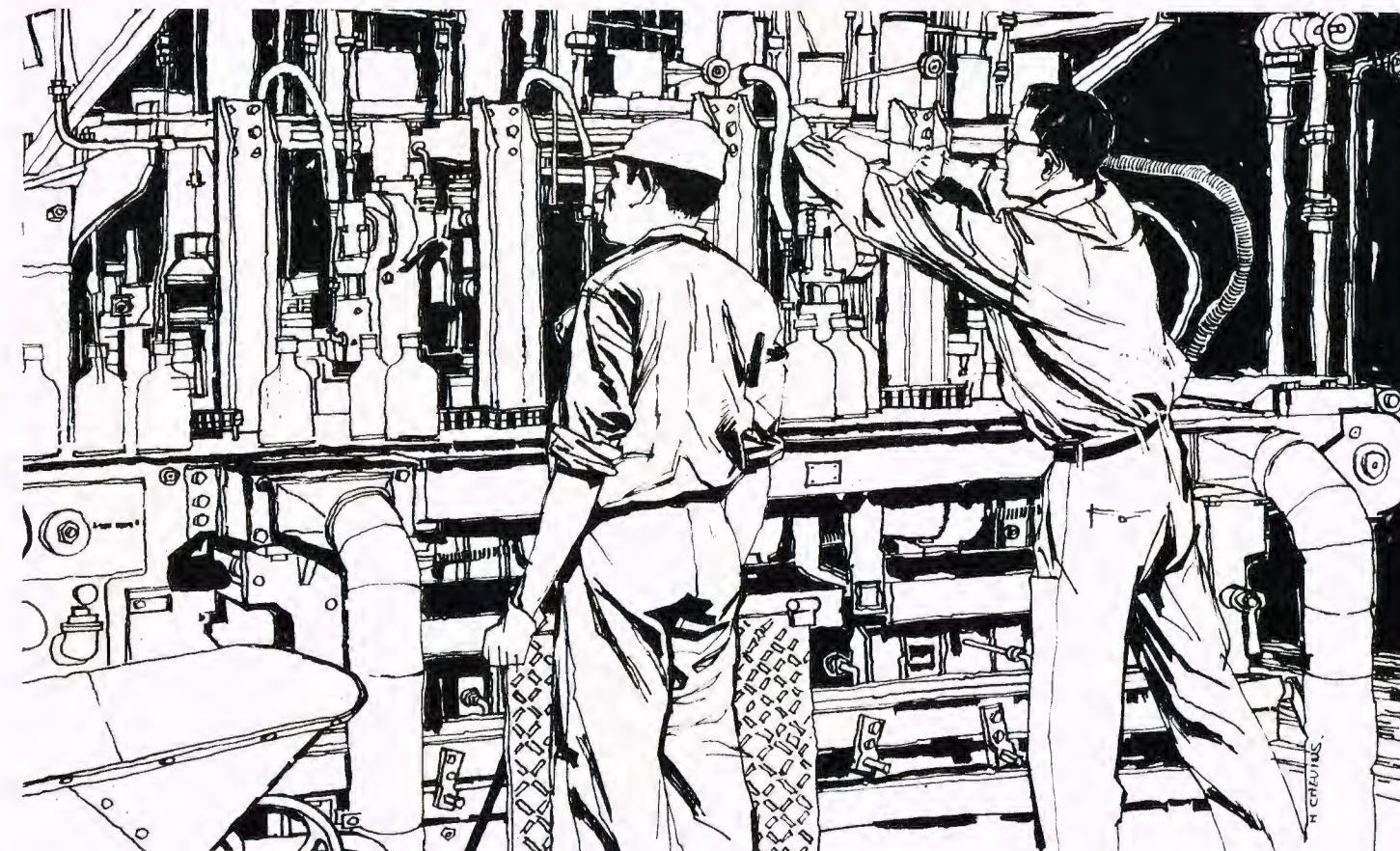
A small proportion of the alkali required by the glass container industry is supplied in the form of saltcake from General Chemicals Division and sodium nitrate from Billingham. These materials are an aid to high quality.

Another Billingham product, sodium silicofluoride, when added to the batch ingredients gives rise to crystals of fluorine compounds throughout the glass, and this is an important method of making opal glass.

Silicones Step In

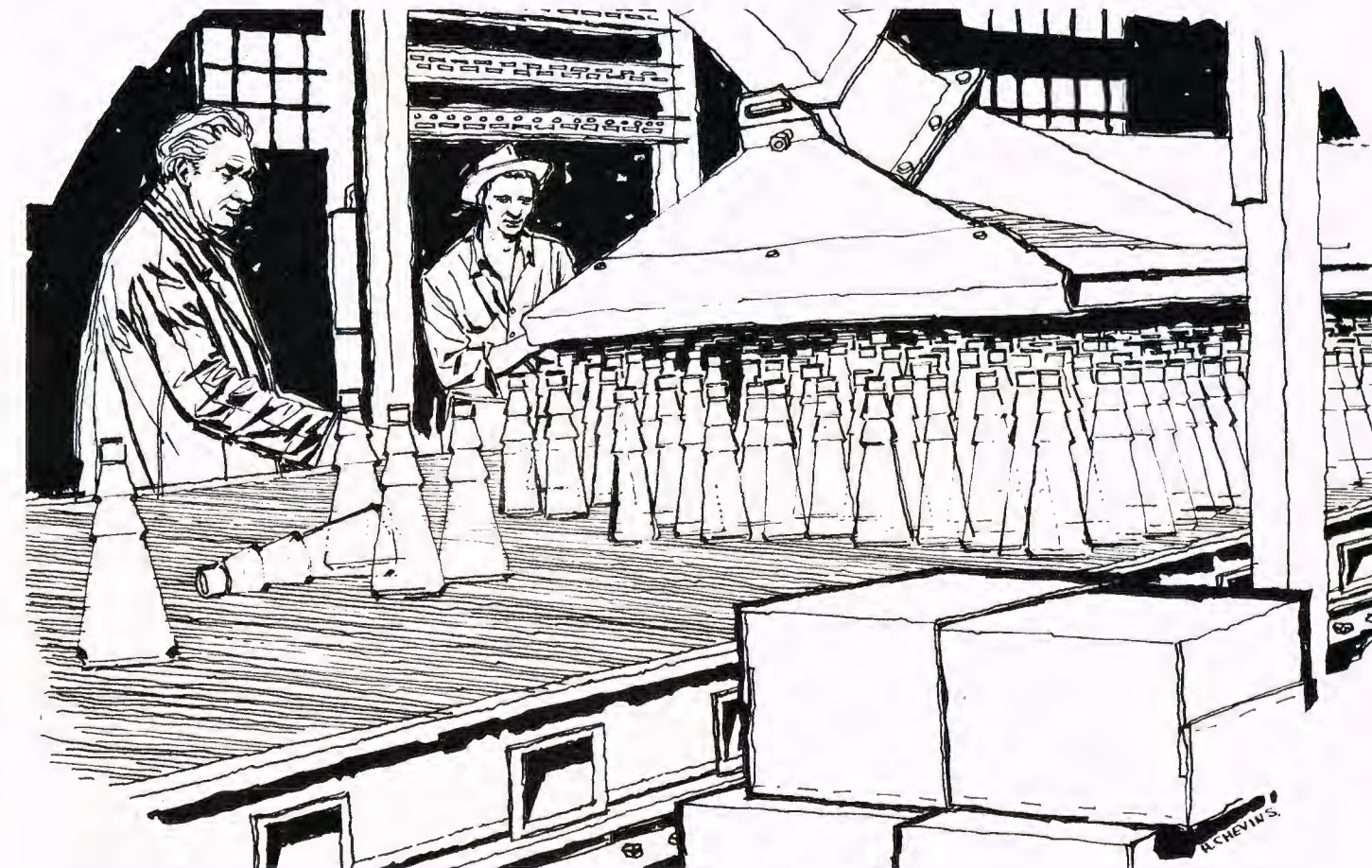
Sulphur dioxide from General Chemicals Division is often introduced into the annealing furnace to control the formation of a "bloom" on the bottles.

In the last couple of years the glass bottle industry has taken up silicones (made by Nobel Division). The shears that cut the molten glass into gobs are lubricated with silicones; so are the chutes down which the gobs slide on their way to the moulds. A little more development work should make it possible to lubricate the moulds themselves with silicones, and so dispense with the inconvenient and inflammable hydrocarbon lubricants at present used.



ABOVE: 200 bottles a minute is the output of this machine. About 25 glass bottle makers up and down the country supply Britain's needs, which now run to something like 4400 million glass containers a year

BELOW: Continuous inspection of glass bottles. The food and drink industries together absorb about two-thirds of all bottles and jars produced and the pharmaceuticals industry one-fifth



NEWS IN PICTURES



Home and Overseas

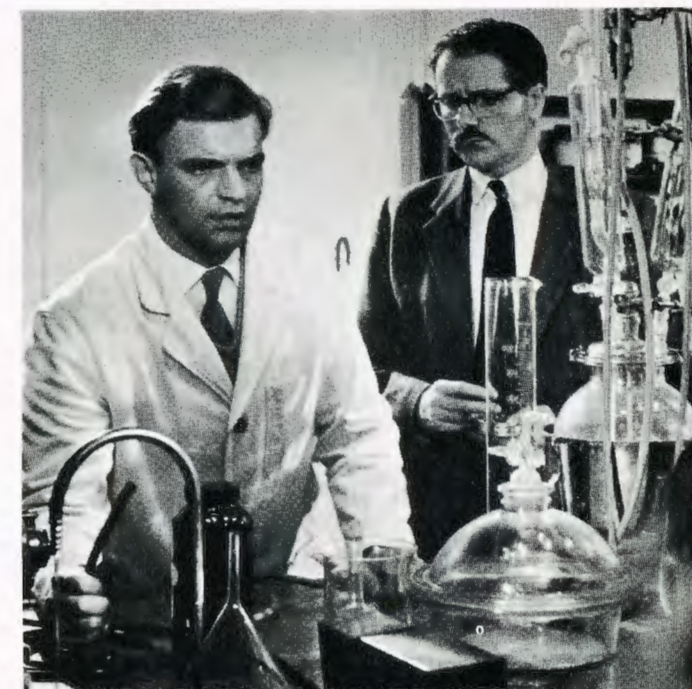


New gardening book. A luncheon was held at the Caledonian Club, London, last month to launch the new Good Housekeeping Gardening Book (see page 83). Here are some of the people concerned with its publication. *Left to right:* Mr. S. Magee, PPL publicity manager, Mr. C. V. Procter, PPL Publicity Department, Mr. G. Baker, Good Housekeeping, Mr. W. Grundy, PPL assistant retail manager, Mr. Percy Thrower, and Mr. E. Hick, PPL retail manager



Home from home. "Boy," a friendly fellow of indeterminate parentage, looks all set for action as he sits aboard the gleaming fire engine at Alkali Division's Winnington Works. His home is at Hartford, several miles away, and the reason for his frequent treks to Winnington remains a mystery

OPPOSITE: **Skyscraper offices.** Our photograph shows a model of the new building development in Manchester's Piccadilly centre. Construction is expected to be completed early in 1963 when the top twelve floors of the skyscraper block will be occupied by the offices of ICI's Northern Regional and Manchester Area Home Sales organisation (see page 82)



"Black Monday." A shot from a new film, *Black Monday*, made by the ICI Film Unit to emphasise the importance of safety precautions while working in a laboratory (see page 84)



It's your pigeon. The villain of the film *It's Your Pigeon*, made by ICI Game Services, looks innocent enough. But *Columba Palumbus*, the common woodpigeon, is one of the scourges of farmers, and the film shows them how to deal with the problem. In the boat, part of a bag of rock pigeons shot from a cable under 400 ft. high cliffs. It took 200 cartridges to shoot 20 pigeons. There were no actors — all the "stars" were expert shots



ABOVE: Our man at Monaco. Mr. B. L. Field, Area Sales Manager, Dyestuffs Department, South Wales Area, negotiates the station hairpin bend on the Monaco Grand Prix circuit during the final run-off of the 120 qualifiers at the end of this year's Monte Carlo Rally

BELOW: New Research Block. The new four-storey laboratory building at Billingham was recently occupied by Heavy Organic Chemicals Division's Research Department. The laboratory design is the combined work of the Division architect, the Research Department, the Nuffield Foundation's Division for Architectural Studies, and Billingham Division's Work Study Department



Engineers in embryo. As part of a pre-university student's course at the Wilton training centre, eight apprentices, seven of them from Billingham, constructed the model of a half-horse-power single-cylinder gas petrol engine seen in this picture. They are all aged from 18 to 19 and all have been accepted for admission to universities to study for engineering degrees



Facing the camera. ICI staff photographers from seven Divisions, down in London for the recent Industrial Photographers' Conference, met together for the first time at a dinner



YZ man. Norman Billing (left) is the first Billingham man to become a member of the YZ Club, which was instituted by the Royal Society for the Prevention of Accidents for people who, by wearing a "hard hat" at work, have avoided serious head injury. Because of his safety helmet Mr. Billing was uninjured when some piping fell from a height on to his head. Here he receives a certificate from Mr. E. A. Blench, Joint Managing Director, Billingham Division



Use no hooks. The "Use no hooks" slogan on the sulphate of ammonia bags used as costumes by two Billingham Division entertainers at Prudhoe's Stores and Traffic Section's party aroused amused comment



Future champion? This chap may never be another Joe Davis, but with John Gibbons' tuition he may soon be Shotley Park Barnado's Home champion. John Gibbons was one of ten Billingham trainee process operators who recently spent a fortnight at Shotley Park as part of an experiment in character training

MOTOR RACING?

is it worth it

by Harry King

MOTOR racing? I can imagine that the reaction of some readers will be "Oh, you mean that highly dangerous pastime followed by a few misguided enthusiasts."

It is impossible to deny that motor racing is dangerous, as indeed it must be when high speeds are involved combined with split-second decisions on the part of human beings. As in many other sports, the element of danger provides a challenge which requires from the participant a high degree of physical fitness and mental concentration. Racing drivers are well aware of the risks they run in common with people who indulge in "dangerous" sports such as mountain climbing, ski-ing and many others.

As far as the spectator is concerned, such are the precautions taken to protect him at a race meeting that he scarcely runs more risk of incurring injury than his counterpart watching an all-in wrestling match who suddenly has one of the contestants thrown from the ring on to his lap! There have, of course, been occasions when spectators have been injured, notably at the 24 hour race Le Mans in 1955. But these, fortunately, are rare and act as a constant reminder to organisers to review their safety precautions in the light of modern racing conditions involving high speeds.

More Popular than Ever

Motor racing is today, more than ever before, a popular sport followed by very large numbers of enthusiastic people, ranging from the schoolboy who selects his racing driver hero and comes to watch him drive, to his father who comes for the same reason yet secretly believes himself to be as good a driver as Stirling Moss if given the opportunity (but dare not say so!) and the more elderly follower of the sport who talks of "the good old days" of Brooklands and Donington Park but nevertheless accepts modern motor racing in an enthusiastic yet critical spirit. It may come as a surprise to the sceptic who doubts the popularity of motor racing to learn that at a Grand Prix event the spectators often exceed in number those who attend the F.A. Cup Final each year at Wembley Stadium. On occasions, it is not unknown at circuits such as the Nurburgring in Germany for as many as 300,000 people to attend a meeting.

There is no doubt that the 1930s were milestones in the history of motor racing.

Who can forget cars such as the 3 and 5.6 litre Mercedes, Auto-Union, Bugatti and Alfa Romeo in the hands of drivers of the calibre of Nuvolari and Caracciola? Not to mention the many other monster machines of that era with outputs of 500 b.h.p. requiring in operation little movement of the steering wheel and a most delicate foot on the throttle. In those days, however, the sport was enjoyed by comparatively few. Today, instead of two circuits at Brooklands and Donington Park, there are now eight first-class tracks developed since 1946 in various parts of the country; and many more abroad, particularly on the Continent.

Demand for Helpers

Clubs such as the British Automobile Racing Club (BARC) and the British Racing and Sports Car Club (BRSCC) have been formed to encourage enthusiasts. Active interest does not necessarily mean driving in races, where numbers are necessarily limited. There is a great demand for people to assist in the running of the many minor national and international meetings held during nine months of each year. Marshals who ensure that races are run to carefully laid down rules in a safe and proper manner; timekeepers; vehicle scrutineers who rigorously check the mechanical fitness of all participating cars, irrespective of the fame of entrant or driver—these are but a few examples of the many officials required to ensure that meetings are run efficiently. Clubs provide these officials from a hard-worked list of volunteers, all of them carefully selected and trained. There is intense pride in the manner in which motor racing is organised; and to encourage further this attitude the recently formed Grand Prix Drivers Association is to make an award each year to the organisers of the most efficiently run race meeting.

I know that it is often said that modern motor racing does not offer the same opportunity to young drivers as in pre-1939 days. In one respect I think this is true, as there is now less likelihood of a young driver quickly reaching the top by driving in a few minor club races. It is now a much more prolonged and competitive apprenticeship which is required, but I feel this is the right course if the standard of the sport is to be maintained at a high level. On the other hand, there is now much more scope for the average



OPPOSITE: The 24 hour race Le Mans for production cars, 1960. ABOVE: A Mercedes at Donington Park, 1937

Photographs: The Motor

performer, and many meetings are held each year which include events for production sports cars and saloon cars. Apart from these, a most important class has recently been introduced embracing the so-called Formula Junior racing car.

Formula Junior was largely instituted to meet the criticism to which I have just referred and to provide a training ground for young enthusiastic drivers who would not under other circumstances have an opportunity to indulge in competitive racing car events. In other words, this type of vehicle enables the comparatively poor man to race; and the Italians who first introduced Formula Junior cars had this aspect very much in mind in drawing up the specification. An FJ car must have an engine which is in standard production not exceeding 1100 cc in capacity. The whole car must weigh at least 400 kg, and in general the mechanical specification must basically resemble that of the chassis from which the engine was derived.

At the other end of the scale is the present Formula I racing car which came into being only in January 1961 and was introduced largely on the grounds of safety by the International Sporting Commission (CSI) of the Fédération de l'Automobile (FIA) for Grand Prix racing. The Formula was accepted with considerable reserve by many drivers and others who follow motor racing. Some were even more outspoken. When the regulations were first discussed before 1961, Stirling Moss openly stated that he hoped he would have retired by the time the new Formula formed the basis of grand prix racing!

Formula I Limitations

In the new Formula engine size is limited to 1500 cc unsupercharged and the total weight of the car has to be not less than 450 kg, while anti-roll bars have to be fitted to protect drivers should the cars overturn. Fuel is now limited to that best commercially available, whereas aviation fuel was previously used. No oil may be taken on during a race, thus lessening the possibility of oil being spilled on the track. In fact Formula I has proved to be workable. In spite of their criticism, drivers have accepted it and provided some first-class racing during the last season. Such is the ingenuity of designers that although engine size was nearly halved as compared with

1960, the maximum speeds and lap speeds achieved at various circuits did not fall and were in some cases increased.

I never fail to marvel at engines of such modest size which achieve outputs of the order of 180-200 bhp and maximum vehicle speeds in the region of 160 mph. I agree that the big cars of the past provided a much more magnificent and romantic sight; but in spite of this, modern motor racing cars with improved suspension, steering geometry and tyres have so considerably improved in road-holding characteristics that there is little doubt that average lap speeds will continue to increase in the coming years. It is indeed a pity that Grand Prix machines now tend to look alike. I can well remember an occasion when a team manager gave urgent signals during a race to a member of a rival team, who acknowledged the request to go faster in a typically British manner, as it so happened that he was leading by a considerable margin at the time!

The Ten Big Races

There are approximately ten races each year for Formula I cars in which the participants compete for the title of World Champion Driver. One of these has the title of the British Grand Prix and is held at either Aintree or Silverstone, while the remainder take place abroad at circuits such as Monaco, Rheims or the Nurburgring. The title of World Champion goes to the driver making the six best performances, with additional points being awarded for achieving fastest lap speed. Approximately sixteen top-line drivers are eligible to compete in each event. Although there is a predominant British representation, nations such as USA, Italy, Germany, Belgium and others are also well represented, thus giving the competition a truly international atmosphere.

Alas, the same cannot be said about the cars, which are even more predominantly British, being manufactured by firms such as Lotus, Cooper and BRM, while the engines are in the main supplied by Coventry-Climax, although BRM have now developed their own engine which it is hoped will be used by them, and possibly others, this season. Competition from the Continent is largely in the hands of Ferrari and Porsche, who build their own engines as well as cars, but it is not

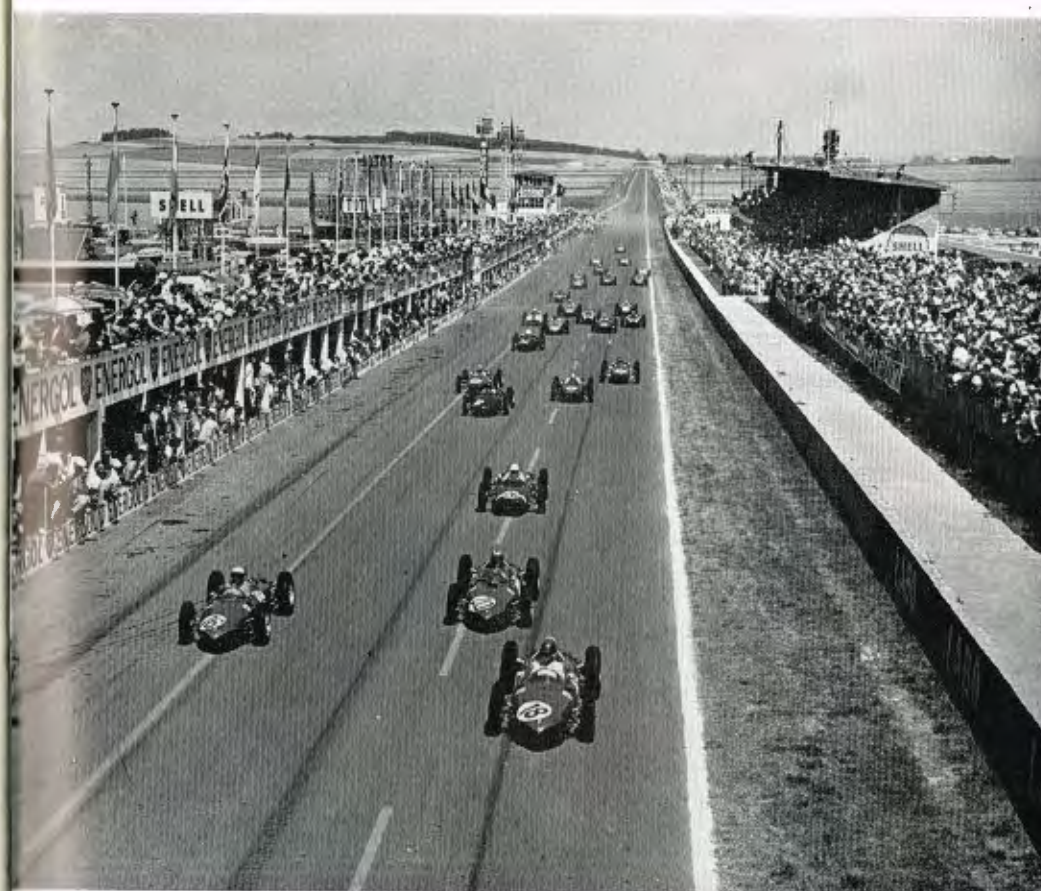
beyond the bounds of possibility that nations such as Russia and Japan will appear on the scene in the near future. There is now considerable debate as to the racing colours which will be allocated to them!

Motor racing has today reached a position where it can stand on its own feet financially, being well supported by the large crowds which it attracts. For the top-line driver the reward is also substantial, as not only do the various teams, sponsored by well-known finance houses, wealthy sportsmen and car manufacturers, retain them on a yearly contract basis at a high fee, but the starting money apart from the prize money offered by the organisers of important meetings is often also considerable. Furthermore, the various petroleum and oil companies make large payments each year to well-known racing personalities and teams in order to connect the brand name of their product with the successes that may be achieved in important races.

The cost of putting a Grand Prix team in the field is high, as not only are the cars and their spare parts expensive, but the cars themselves together with supporting staff have to be moved from place to place, often by road in large transporters costing many thousands of pounds, or sometimes by air if several events occur over a short period and time is vital. It is only necessary to walk round the paddock at any race meeting to gain an impression of the planning required to get the cars to the starting grid. Apart from each team's vehicles, there are petrol tankers, tyre manufacturers' vans, mobile workshops—to name only a few examples of the many suppliers and specialists. The work is hard. I have known a team work throughout the night to get a car on the road again after damage incurred during practice only to see the car spin off and be damaged at exactly the same place in the first lap of the race.

Prestige Boosts Sales

Then, too, the question of prestige is of importance, and there is no doubt that the British motor industry gains a great deal from the successes achieved in motor racing, particularly abroad. The Italian motor industry and government for this reason support Enzo Ferrari, who achieved tremendous success in racing last year by winning both the Driver and



ABOVE: The Ferraris get away from the grid at the French Grand Prix, 1961



BELOW: Stirling Moss takes the flag at the European Grand Prix, 1961

Constructors' Championships. It is perhaps not without significance that he has openly admitted that but for the use of components of British design such as disc brakes and engine bearings such victories would not have been possible. In this country little importance seems to be attached by the government to the prestige aspect of motor racing, although at one time it was conceded that no purchase tax would be charged on racing cars. As from this year, however, this will no longer be the case, and tax amounting to some £60,000 will be collected unless some more farsighted official decrees otherwise. Yet, if Britain enters the Common Market, prestige will become of increasing importance to enable our motor industry to compete with vehicles produced in countries such as Germany and Italy.

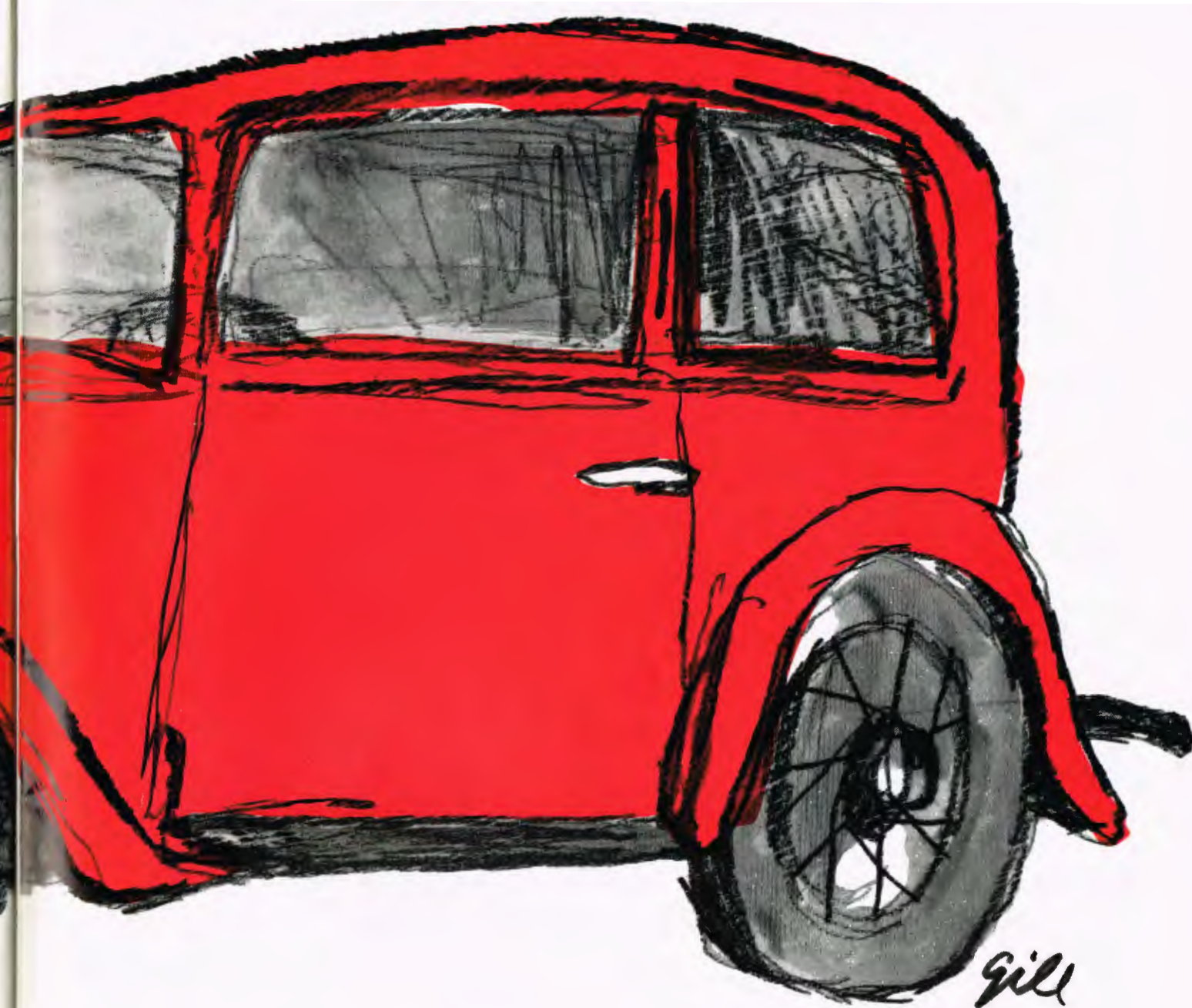
Ultimate Justification

I am often asked, "What is the justification for motor racing?" From the point of view of spectacle, motor racing requires little justification, as it now draws large crowds who by and large come to watch good racing rather than to see accidents occur. But this does not mean that little or nothing has resulted from the tremendous technical effort put in. The tyre manufacturers admit to having gained a great deal from their racing experience, and this has been passed on to the motoring public. The car owner who now boasts disc brakes will perhaps be surprised to know that these were first used on the Jaguar cars which won the 24 hours race of Le Mans in 1953. It was entirely due to a demand for such a brake to meet the gruelling conditions of the circuit that the disc brake as we know it today was developed.

Recently the Ferguson organisation entered a newly designed car in an important racing event in order to gain experience under racing conditions with the revolutionary form of transmission to all road wheels together with an anti-skid type of braking system based on aircraft practice. In due course, after considerable testing under racing conditions, it is the intention to incorporate these systems in a car to be offered to the motoring public. The development of the use of new materials of construction such as titanium for engine components, including connecting rods, crankshafts and valve springs, is also going ahead in conjunction with racing car manufacturers and the racing teams.

The Best Little Car for its Money in the World A £10 Ruby Austin Seven

by J. B. Pattison



"There's the car park on the left," said Joyce. I pulled over to the entrance and stopped. Parked there was a blue Ruby Seven (yes, blue Ruby—blue was the car's colour and Ruby Seven is the class name). The attendant turned to us to give us our ticket and his eyes lit up.

"Where are you from?" he asked in a Norfolk accent.

"Billingham," I replied.

"And she's brought you all that way! Any trouble?"

"No, a good run averaging 35 mph."

"They're grand little cars—that's mine over there," he said, pointing to the blue Ruby. "I did a decoke last night. I'll show you the valves I took out. How she went at all before the decoke is a wonder

to me." He went across to his car. My wife and I smiled at each other. We were getting quite used to this sort of thing.

"The Austin Seven is acknowledged to be the best small car in the world," so says the 1936 handbook. I bought mine 21 months ago for £10. I couldn't drive, although I did remember something about the Otto and Carnot cycles from physics lectures and "suck, squeeze, bang and blow," from RAF instructors. The previous owner, being a professional driver, gave me some instructions, and we set off for the first run. The car chugged along quite merrily and I felt very pleased to think that I *could* make it go, but when I tried a hill start I damaged an axle-shaft key and limped home.

The second key went two or three months later while ascending Birk Brow in the Cleveland with four up. She stopped. Ken and I had a quick council: "We'll run her backwards, reverse into that farm lane, push her out, and run down the hill to that service station half-way down." Arriving there, I admitted to having no spare key with me. On explaining the situation to the proprietor he gave us a file, hacksaw, an old bolt and the use of his vice. After two hours' work a key was produced which fitted perfectly. Again we turned back for home.

I was advised to apply early for a driving test, as the list was reputed to be enormous. The date turned out to be five weeks from the date of buying the car. I

failed, but gained some valuable experience. The second test came a month later.

"Which is your car, Mr. Pattison?" asked the examiner. I pointed to the Austin and noted the look on his face. We walked over to it, he went to the front to look underneath, then to the back, then he got in. This time I passed.

The first trip of over 100 miles I did was to Scarborough via Whitby and the moors. I was accompanied by a 1954 Ford Prefect, just in case. The Austin gave no trouble, but the Prefect broke down with fluff in the main jet.

Shortly after this she had a repaint. The colour had been black, but now she was to be signal red. This colour proved

to be too violent, so she had another coat of a deeper home-produced red which was christened "car red." For a while I was often asked by my friends to stamp and post a letter, or hurry to a nearby fire.

The ten-year test loomed near. I took her for a voluntary test, and the report I received virtually said "scrap it and buy one of ours." Not being able to afford to take this advice, Ken and I gave her a set of ex-WD double dip headlights, overhauled the steering gear, scrapped the cable brakes and fitted a hydraulic conversion, did a decoke and valve grind, then presented her again. She passed.

Since then she's amply repaid the time spent on her. She's in daily use and has given us many happy hours spent touring

in the county. A favourite run is up to Stanhope in Weardale for a picnic by the riverside having travelled through Bishop Auckland along the valley through Frossterley (famous all over the world for its marble) and Wolsingham, then leaving Stanhope, climbing up a hill 1 in 6 with two hairpin bends over Bollihope Common into Egglestone and then to the Tees Valley at Barnard Castle, along to Darlington, then home. During our holidays last year we travelled 844 miles in a week, touring in Norfolk from Great Yarmouth with only a slow puncture.

As a group manager said one evening in the car park as I hand primed the fuel pump, "Cars have never been the same since you stopped having to do that!"



Actual size



A cipher or symmetrical monogram—a secretive device popular in the early eighteenth century. Difficult to decode, cipher seals helped to conceal their owners' identities except from their intimates. On this one the relief effect has been heightened by cutting the design on a concave matrix instead of a flat one, thus producing a raised convex impression

For the man with a short purse there is a new collectors' craze . . .

by Cedric Jagger

fob seals

SEALS—not the marine carnivorous mammals, but the sort you use with sealing wax—are as old as history. Their main purpose has always been to prove authenticity, whether it be of state or other official deeds and documents, or merely of private correspondence. You could—save for one big difference—liken them to the present-day multiplicity of rubber stamps which appear on everything from passports to hire-purchase forms. For us, however, rubber stamps are usually just a quick and convenient method of tackling what might otherwise be a long and tedious job, whereas for our ancestors of, say, six or seven hundred years ago seals were a necessity, since very few of them indeed could read or write even their own names.

Early seals are often large and imposing, and their detail has provided many clues to the dress, habits and customs of their time. Most of them are single-sided, and on their plain reverses they sometimes reveal something unexpectedly human—fingerprints. This is because they were formed from beeswax, which had first to be softened with warmth and kneading, and then pressed into the seal matrix, usually made of silver. They were then suspended from a cord looped through holes in a narrow fold of the parchment, the loose ends being worked into the beeswax just before completing the impression. Sometimes a whole series of seals were attached to the same cord.

Seals did not become an integral part of a document, rather than an appendage to it, until the introduction in the seventeenth century of the substance on which modern sealing wax is based—shellac. From then onwards, too, a subtle change started to take place in the function of seals. Though initially very



The handle of a seal has been given various names at different times—stem, staff and shank—but collectors nowadays usually call it the stalk. Seventeenth-century stalks, following the medieval pattern, were short, plain and roughly cone-shaped, but towards the end of the century became more elongated and were given some turned decoration (No. 5). The commonest form of stalk throughout the eighteenth century is called "C-scroll reversed," and No. 2 is an unusually small specimen. Other types started to appear in the late eighteenth and early nineteenth centuries, notably various forms of the split stalk (No. 6), the pedestal stalk (No. 8), the double C-scroll reversed (No. 9), the octangle (No. 3) and the baluster (Nos. 1, 4 and 7). The stalk of No. 10 indicates that it was made in Birmingham, for the anchor is the symbol of the Birmingham Hall of Assay and—aside from being included in its hallmark—was often used by local craftsmen to decorate their wares

slow to take effect, developments in printing—with the enormous potential improvements in mass communication and education which they entailed—had provoked more and more people into learning to read and write, and it would have been understandable if seals had died a natural death. In fact, the reverse happened.

There seem to have been two reasons for this. The first was that shellac permitted a seal to be used for security—as a closure to ensure privacy for a folded letter, since envelopes and modern

adhesives were still unknown—as well as providing authenticity additional to the signature of the writer.

Secondly, a seal made a remarkably fine piece of jewellery. However much one may decry the dandies of the eighteenth century, a great many of them were sensitive, intelligent, highly educated and articulate human beings, who went to enormous trouble to cultivate good taste in all things, and to set standards of design and workmanship which are as highly appreciated today as in their own time. A seal, perhaps set into a ring, or



Shakespeare's profile on an eighteenth-century seal—not uncommon. This one is No. 2 in the previous illustration, something of a rarity, standing only 9/16 in. high



The owner's crest in association with his monogram—a popular eighteenth-century device on a seal



with a prettily contrived handle, attached to a chain dangling from the fob pocket—the other end would have been attached to an equally attractive watch—was not only a functional accessory, but a delightful bauble of which the owner was justly proud, and which he would take great pleasure in showing to his friends.

The enormous popularity of personal seals in the eighteenth and nineteenth centuries is well demonstrated by the thousands of them which remain in circulation today, and that is one of the reasons why they make such a good subject for the collector of modest means. Another, of course, is their very personal connection with some individual in past history, whose identity they can sometimes be made to reveal.

The most fashionable seals of the eighteenth century were made of gold, with an inset matrix of engraved hardstone. They were expensive, costing anything from seven to twenty guineas apiece. Less expensive ones consisted of a hardstone matrix set in silver or base metal—usually pinchbeck or gilded brass—and there were also seals made wholly

of stone, silver or steel. Personally, I favour steel, which, because it can be drilled, sawn, filed, turned or chiselled, is particularly suitable for finely detailed workmanship, and yet, with its intrinsic hardness, rarely shows any signs of wear and tear. Steel, too, works well with modern sealing wax, giving a remarkably crisp impression, while silver tends to stick, retaining some of the wax in the matrix. Aside from producing an imperfect impression, this means also that the seal itself must be carefully cleaned before re-use.

Cottage Industry

All but two of the seals illustrated are steel, and many of them probably originated from Woodstock in Oxfordshire, where a thriving cottage industry for the making of small cut and faceted steel articles existed from about the middle of the eighteenth century. This trade was eventually supplanted by Matthew Boulton with the output from his Soho Works in Birmingham.

Appreciation of seals centres round the two most obvious features—the handle

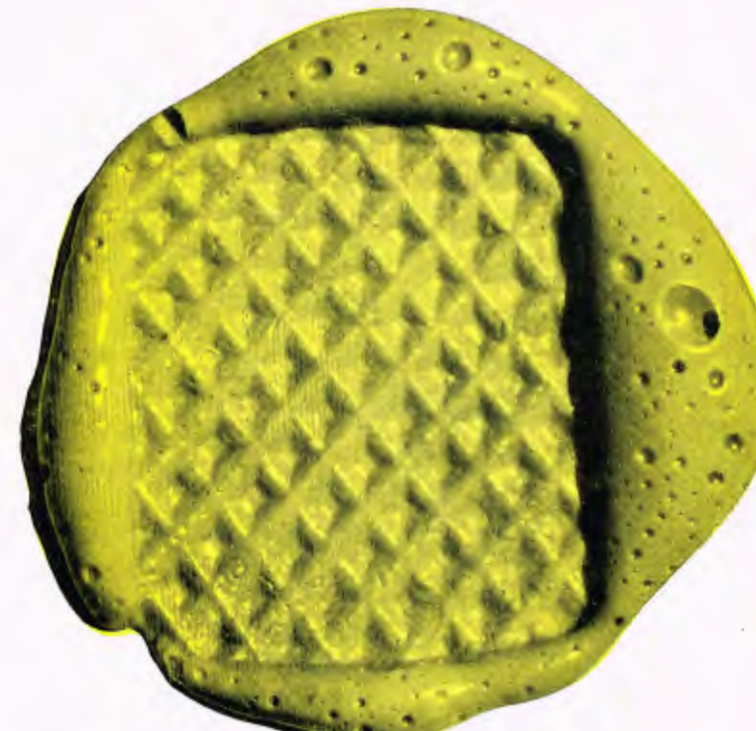
or "stalk," and the matrix. Seals of the seventeenth century generally had plain, stumpy and more or less cone-shaped stalks, a style which had carried on from medieval times. Towards the end of the century, however, some turned decoration was introduced on these, while at the same time there started to appear an openwork stalk—of the type usually called "C-scroll reversed"—which was to become the standard form most commonly used throughout the eighteenth century.

Another popular design of stalk was the octangle, while various types of so-called baluster stalks occurred, as well as an openwork form which might be called "double C-scroll reversed." An entirely different type, of which many varieties are known, is the split stalk. This was usually made by clamping together two thin sheets of metal, cutting the design through both of them, soldering them together at the top and opening them out below, the extremities then being soldered to the matrix setting. Split stalk seals in steel, however, were usually made in one piece, being subsequently divided and opened out.

A word about size. The smallest seal



Secret symbols of freemasonry are cut on this seal. Comparatively rare, masonic seals are much sought after by collectors



A "file-cut" matrix, used in sealing letters before the days of envelopes and adhesives. The method was to put a moistened gelatine wafer between the flaps of a folded letter and then press them together with the seal



illustrated here is something of a rarity, standing only 9/16 in. high, and at the other end of the scale I have occasionally encountered specimens which top the 2 in. mark. Most seals, however, will be found to average about 1 in. in height.

Matrix Designs

It is very difficult to date some of these seals with accuracy, but the character of the matrix sometimes helps. Most of these incorporate formal designs, but there is one quite common type of matrix which does not. Instead, it exhibits a criss-cross pattern—something like the face of a file greatly enlarged—which protrudes from, rather than is recessed into, the metal surface. This type of seal was almost certainly intended for use not with sealing wax, but with the small gelatine wafers which were the prototypes of the gum we lick when sealing our envelopes.

These tiny discs of gelatine—carried in special boxes, which are now themselves collectors' pieces—were first moistened with the tongue and then placed between the flaps of a folded letter, not, as with a wax seal, on top of them. The

seal was then applied with considerable pressure to the outside, and the projecting serrations on the matrix forced the "sandwich" of paper and gelatine into a strong bond with each other. Unlike wax seals, with their highly personal designs, gelatine wafers left almost no outward and visible sign of their use at all, and certainly gave no clue to the identity of the writer. I always like to think that this anonymity may have helped to preserve many an eighteenth-century romance from the malicious tongues of the scandal-mongers of that time.

Collectors are particularly keen on matrices incorporating heraldic devices—ranging from a full coat of arms, with crest, supporters and motto, simply to a crest with or without monogram—since the original owner of these can usually be traced. Monograms by themselves don't offer much scope for research, although ciphers—symmetrical monograms—are amusing, difficult to unravel and fairly uncommon. Another rarity, equally mysterious to the layman, is the seal engraved with the symbols of freemasonry. Every seal-cutter, too, had a

range of popular designs for clients who had no heraldic background or whose initials were too awkward to form into a monogram, and these included St. George and the Dragon and Neptune, in addition to the well-known but stylised profile of William Shakespeare!

Prices from 30s.

Finally, a hint on prices today. Gold seals are expensive and becoming more so, with £5 apiece a conservative estimate. Silver and steel seals, however, can still be found with a little searching, a middle price-level for them being about 30s. each, while pinchbeck and base metal seals should be even cheaper. Much depends on the dealer, however—some do tend to overvalue their stock. As to seals themselves—of course, they're still being used. Every company has to have one with which to authenticate its most important official transactions, and don't forget that little red paper wafer which is often in evidence on legal documents—that's a seal, too. These modern seals may never become collectors' pieces, but at least they show that old customs die hard.



Warren House Gardens. *Photo by David Lessels (Paints Division)*